Canadian Aviation
Safety Board

Bureau canadien
de la sécurité aérienne

Aviation Occurrence Reports

Issue 4

89-00258/

AVIATION OCCURRENCE REPORTS

© Minister of Supply and Services Canada 1988

Cat. No. TU2-3 4E

FOREWORD

AVIATION OCCURRENCE REPORTS

In accordance with the CASB Act, part of the Board's objective is to report publicly on its investigations, on the related findings, and on any recommendations designed to eliminate or reduce safety deficiencies.

Therefore, this publication, AVIATION OCCURRENCE REPORTS, presents reports on CASB investigations, findings, and recommendations as adopted by the Board. The sole intent in providing this information is to advance aviation safety. It is not the object of the Board to determine or apportion any blame or liability in connection with aviation occurrences.

Anyone wanting to employ the AVIATION OCCURRENCE REPORTS for purposes other than advancing aviation safety could find the information incomplete.

This publication is also available in French.

A limited number of copies of this publication are retained and are available from:

Canadian Aviation Safety Board
P.O. Box 9120 Alta Vista Terminal
Ottawa, Ontario
KIG 3T8

Cette publication est également disponible en français.

On peut obtenir des exemplaires de la présente publication en nombre limité auprès du:

Bureau canadien de la sécurité aérienne
C.P. 9120 Terminal Alta Vista
Ottawa (Ontario)
KIG 3T8

This publication contains reports of aviation occurrences, in Canada, involving Canadian or foreign-registered aircraft.

TABLE OF CONTENTS

Page

EXPLANATORY NOTES . . . .

DEFINITIONS v

REPORTS AND SYNOPSES

I FIXED-WING CONVENTIONAL AIRCRAFT:

A. Public Transportation
- (i) 5 700 kg (12,500 lb) and over 1
- (ii) Under 5 700 kg (12,500 lb) 5

B. Commercial Training
- (i) Flying Clubs and Commercial Specialty Training 13

C. Other Commercial Operations 20

D. Private
- (i) Wheeled landing gear 35
- (ii) Other (float, skis, hull, amphibious) 69

E. State 82

II ROTARY-WING AIRCRAFT:

A. Commercial Operations 84

B. Private . . . . NIL

C. State . . . . NIL

III OTHER TYPES:

A. Amateur-built, ultralights, gliders, balloons, and others 98

AVIATION SAFETY RECOMMENDATIONS: 119

ANNEXES

Annex 1 — List of reports by aircraft manufacturer and type 127

Annex 2 — List of reports by province/territory of occurrence 133

EXPLANATORY NOTES

TYPES OF REPORTS

The CASB currently produces three types of occurrence reports. The most common format is the Summary Report which summarizes the details of the investigation in one or two pages. The next level is the Intermediate Report which is somewhat longer and more detailed. For both these types, the complete public report is reproduced in this publication. More factual information is available on Summary and Intermediate Reports and can be obtained by contacting the CASB and referencing the report number. Finally, a small number of investigations (generally 15 to 20 per year) result in International Civil Aviation Organization (ICAO) format reports. For the latter type of report, only the Synopsis and the Conclusions and Recommendations sections of the report are included in this publication. The full report can be obtained by contacting the CASB and referencing the report number (which is included with the Synopsis). Laboratory reports, if laboratory analysis has been carried out, are available for all three categories of reports and can be obtained in the same manner.

GROUPING OF REPORTS

For ease of reference, the reports in this publication are grouped by broad category of aircraft type and by type of operation within each group. The reports are then presented chronologically (by the date of the occurrence) within each subgroup.

For fixed-wing conventional aircraft, the first subgroup is Public Transportation. This includes scheduled, other unit toll, and charter operations. Note that this subgroup is further divided into occurrences involving (i) aircraft of 5 700 kg (12,500 lb) or over and (ii) aircraft under 5 700 kg (12,500 lb). The second subgroup is Commercial Training. This includes licensed flying clubs and commercial specialty training (commercial licence classes 6 and 7, respectively). All other types of fixed-wing aircraft commercial operations are grouped under Other Commercial Operations. The Private aircraft subgroup includes all privately registered aircraft, both personal and corporate. It is further subdivided according to type of landing gear. The final subgroup contains occurrences involving state-owned aircraft.

For the rotary-wing category, there are fewer aircraft and fewer occurrences. Thus, only three subgroups are used, viz. Commercial, Private, and State.

The final category contains occurrence reports for all other types. This includes amateur-built aircraft, ultralights, gliders, balloons, etc.

CONTENTS OF SUMMARY REPORTS AND INTERMEDIATE REPORTS

Information on Aircraft:

The first block of each report identifies the type of aircraft involved in the occurrence, the model, the registration, the location, and the date of the occurrence; for commercially operated aircraft, the operator is also identified.

Occurrence Report Number:

The second block commences with the occurrence report number (any queries to the CASB should carry this reference). The first two numbers identify the year of the occurrence, the first letter identifies the CASB office that conducted the investigation ('A' - Atlantic, ' Q' - Quebec, '0' - Ontario, 'C' - Central, 'W' - Western, 'P' - pacific, 'H' - Head Office). The first number after the letter identifies the year of the decade of the occurrence. This block also contains information on the type of investigation (a correspondence investigation is one in which the site of the occurrence was not visited by a CASB investigator), the time of the occurrence, the type of operation, the extent of damage to the aircraft, and the type of licence held by the pilot.

Pilot Hours:

This block indicates the total number of hours the pilot had acquired on all types of aircraft, the total number of hours on type, and the number of hours flown in the last 90 days (in total and on type).

Injuries:

The injuries sustained by the crew, passengers, or others are classified as Fatal, Serious, or Minor/None (See Definitions).

Summary Report Narrative:

The narrative summarizes the history of the flight, pertinent factual information and analysis. The narrative is divided into two parts:

(a) the factual information or a description of what happened, which begins with a description of the history of the flight as close as possible to the occurrence, followed by the pertinent information; and

(b) an analysis of why the occurrence happened.

Findings:

The Board's findings from an investigation are grouped under two subheadings, as follows:

Cause-Related Findings: Any element of the occurrence, found during the investigation which, if removed, would have prevented the occurrence, or, if removed, would have avoided or reduced damage to property and people.

Other Findings: Information, discovered during the investigation of an occurrence, which is not cause related but has the potential to enhance or degrade aviation safety.

Safety Action:

For all aviation occurrence investigations, relevant data are recorded to facilitate statistical analysis and the identification of system-wide safety deficiencies through safety studies. In cases where an individual occurrence investigation leads to significant safety action being taken, that action is included in the public report immediately after the Findings.

Aviation Safety Recommendations

Regardless of the type of occurrence report, if the investigation leads to the issuance of a CASB Aviation Safety Recommendation, it is included in the Safety Action section of the report. Additionally, all Aviation Safety Recommendations issued during the preceding reporting period are summarized beginning at page 119 of this publication.

DEFINITIONS

(Extracted from the Canadian Aviation Safety Board Act/Regulations)

"AVIATION OCCURRENCE"

(a) any accident or incident associated with the operation of aircraft, and

(b) any situation or condition that the Board has reasonable grounds to believe could, if left unattended, induce an accident or incident described in paragraph (a).

"ACCIDENT"

"ACCIDENT" means any aviation occurrence where, at any time during the period commencing when the first person boards an aircraft for the purpose of flight and ending when the last person disembarks from the aircraft after the flight,

(a) a person other than a stowaway, sustains a serious injury or fatal injury, that is not self-inflicted or inflicted by another person or caused by natural causes, as a result of that person

  i) being in the aircraft,

  ii) coming in direct contact with any part of the aircraft, including any part that may have become detached from the aircraft, or

  iii) being directly exposed to the jet blast of the aircraft,

(b) the aircraft sustains damage or structural failure adversely affecting the structural strength, performance or flight characteristics of the aircraft and normally requiring major repair or replacement of any affected component part, other than damage or failure that is limited to

  i) the engine, its cowling, or its accessories,

  ii) the propellers, wing tips, antennae, tires, brakes or fairings, or

  iii) small dents or puncture holes in the aircraft skin, or

(c) the aircraft is missing or is completely inaccessible.

"SERIOUS INJURY"

"SERIOUS INJURY" means an injury that is sustained by a person in an accident and that

(a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was sustained,

(b) results in a fracture of any bone, other than a simple fracture of the nose or of any fingers or toes,

(c) involves lacerations that cause severe haemorrhage or nerve, muscle or tendon damage,

(d) involves injury to any internal organ, or

(e) involves second or third degree burns, or any burns affecting more than five per cent of the body surface.

"INCIDENT"

"INCIDENT" means an aviation occurrence, other than an accident, that affects or could affect the safe operation of an aircraft. Incidents can be reported to the CASB through mandatory or voluntary reporting mechanisms.

According to the CASB regulations a "reportable incident" means any incident involving an aircraft with a maximum certified take-off weight greater than 5 700 kg where

(a) an engine fails,

(b) smoke or fire occurs, other than an engine fire that is contained within the engine and does not result in engine failure or damage to other component parts of the aircraft,

(c) difficulties in controlling the aircraft in flight are encountered due to any aircraft system malfunction, weather phenomena, wake turbulence, operations outside the approved flight envelope, or uncontrolled vibrations,

(d) the aircraft fails to remain within the intended landing or take-off area, lands with one or more landing gear retracted, or drags a wing tip or engine pod,

(e) any crew member is unable to perform his flight duties as a result of incapacitation,

(f) decompression, explosive or otherwise, occurs that necessitates an emergency descent,

(g) a fuel shortage occurs that necessitates a diversion or requires approach and landing priority at the destination of the aircraft,

(h) the aircraft is refuelled with the incorrect type of fuel or contaminated fuel that is undetected prior to departure from the ramp,

(i) a collision or risk of collision with any other aircraft or with any vehicle, terrain or obstacle occurs, including a collision or risk of collision that may be related to air traffic control procedures or equipment failures,

(j) a flight crew member declares an emergency or indicates any degree of emergency that requires priority handling by an air traffic control unit or the standing by of a crash, fire fighting or rescue services, or

(k) toxic gases or corrosive materials leak from any cargo aboard the aircraft.

* * * * *

RISK OF COLLISION BETWEEN:
BOEING B737 NORDAIR FLIGHT 843
and CESSNA 172 C-GCKX
THUNDER BAY AIRPORT, ONTARIO
07 NOVEMBER 1984

LOCAL TIME: 1120 EST
INFORMATION SOURCE: Field Investigation

BOEING B737 NORDAIR FLIGHT 843
REPORT NUMBER: 84-C44029 (Incident)
OPERATOR: Nordair Ltd.
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	Unknown

CESSNA 172 C-GCKX
REPORT NUMBER: 84-C44029 (Incident)
OPERATOR: Thunder Bay Flying Club
OPERATION: Flying Club Training
DAMAGE: None
PILOT LICENCE: Commercial

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The Boeing B737, Nordair Flight 843, was departing Thunder Bay on a regularly scheduled flight and had been cleared for take-off on runway 25. The Cessna 172, with a student and an instructor on board, was carrying out circuit training using runway 30. After issuing the take-off clearance to the B737 aircraft, the tower controller became involved with traffic which was operating near Kakabeka Falls, and, as a result, he did not clear the Cessna to land. The Cessna pilot carried out an overshoot and began a climb on the runway heading. The Boeing and the Cessna were then in conflict as runways 30 and 25 intersect. The Controller observed the potential conflict and instructed the Boeing to stay low on take-off.

The Boeing crew then saw the Cessna and lowered the Boeing's nosewheel back onto the runway. The crew of the Boeing extended the ground run until the aircraft was clear of the Cessna and then lifted off safely.

The air traffic within the Thunder Bay Control Zone was assessed as light to moderate and of a normal complexity. The tower equipment was operating normally. There were two air traffic controllers on duty and three other persons in the tower at the time. The noise level was high. The tower controller forgot about the Cessna, and the Boeing crew was unaware of the Cessna aircraft, as they were informed only of the traffic at Kakabeka Falls. The Cessna was following the overshoot procedure established at a recent local pilot/controller meeting. The Cessna pilots stated that they were unaware that the Boeing was taking off. The two aircraft passed within 200 feet of each other.

The controller did not provide the required separation between the Cessna and the Boeing when he became busy with other traffic in his area of responsibility, and he forgot about the Cessna.The level of noise in the tower would have been distracting and may have been a contributing factor. Although the Cessna pilots followed an established missed approach procedure, had they been more attentive, they would have heard the Boeing's take-off clearance and could have taken early avoidance action. The timely action by the Boeing crew, following the controller's warning, prevented a possible collision.

FINDINGS:

Cause Related:

1. The required separation between the Cessna and the Boeing was not provided because the controller became occupied with other traffic and forgot about the Cessna.

2. The Cessna pilots did not hear the Boeing's take-off clearance, and, as a result, they did not take early avoidance action.

Other:

1. The timely action by the Boeing crew, following the controller's warning, prevented a possible collision.

2. Because there were three extra persons in the tower, the noise level created a distraction to the controller.

* * * * *

RISK OF COLLISION BETWEEN: BOEING 737 and PIPER PA-31 NAVAJO C-GBSN
THUNDER BAY, ONTARIO 10 mi NW
28 JANUARY 1985

LOCAL TIME: 0957 EST
INFORMATION SOURCE: Correspondence Investigation

BOEING 737
REPORT NUMBER: 85-C54001 (Incident)
OPERATOR: Nordair Ltd.
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	Unknown

PIPER PA-31 C-GBSN
REPORT NUMBER: 85-C54001 (Incident)
OPERATOR: Bearskin Lake Air Service Ltd.
OPERATION: Charter
DAMAGE: None
PILOT LICENCE: Airline Transport

INJURIES	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	Unknown

SUMMARY REPORT:

The Nordair Boeing 737, operating under instrument flight rules (IFR), was 15 miles northwest of the Thunder Bay Airport and descending through 7,400 feet with a clearance to 3,400 feet. A short time later, terminal control advised that there was Navajo straight ahead at five miles climbing northbound out of 4,000 feet for a cruising level of 8,500 feet. The Navajo was operating under visual flight rules (VFR). The Nordair aircraft spotted the Navajo and altered course, passing within one mile of the Navajo.

Due to the amount of mixed IFR/VFR traffic at Thunder Bay, workload permitting, departing VFR pilots are requested to contact terminal control when they clear the control zone and report their altitude. This is strictly a safety measure to facilitate the provision of traffic information. VFR traffic does not receive clearances, and pilots must adhere to the visual flight rules.

The Thunder Bay weather sequence at the time of the occurrence indicated that there was an overcast layer at 3,500 feet. Pilot reports indicated that the overcast layer was topped at about 3,800 feet. The Nordair flight, which was in the clear above the cloud layer when the Navajo was sighted, was able to take evasive action. It appears that, by climbing above an overcast layer, the Navajo pilot did not adhere to the visual flight rules.

FINDINGS:

Cause Related:
1. An aircraft under controlled IFR flight had to take evasive action to avoid VFR traffic above a cloud layer.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

CANADIAN PACIFIC AIRLINES LTD.
BOEING 747-217B, C-FCRA
OVER THE PACIFIC OCEAN
01 FEBRUARY 1985

REPORT NUMBER: 85-P54001 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0715 PST
OPERATION: Scheduled International
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	22,000	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	13
PASSENGERS	-	-	290

SUMMARY REPORT:

The aircraft was en route from Tokyo to Vancouver, when the smoke detector alarm from toilet D sounded. The cabin crew investigated and found a smoldering fire in the waste basket.

A flight attendant attempted, without success, to extinguish the fire by pouring water into the basket. The waste basket was then removed from its cabinet, and the fire was put out with a Halon fire extinguisher.

A smoldering cigarette was found amongst the papers in the waste receptacle. One of the flight attendants remembered the last person to leave the washroom. This person, an elderly Chinese gentleman, who was sitting in a non-smoking section, was interviewed by the crew, and he admitted that he had smoked in the washroom. This gentleman did not speak English or French; however, a Chinese-speaking flight attendant determined that this passenger spoke Cantonese but probably could not read. The public address announcements concerning the prohibition of smoking in the aisles and washrooms were made in English, Japanese and Cantonese. There was a pictorial "No Smoking" sign outside the washroom door; however, in the washroom, the sign prohibiting cigarette disposal in the waste basket was written.

The Chinese passenger did not comply with the verbal and pictorial directions concerning smoking prohibitions in the aircraft. As he probably could not read, he would not have been able to understand the written sign prohibiting cigarette disposal in the waste basket.

FINDINGS:

Cause Related:

1. A passenger did not comply with the verbal and pictorial directions prohibiting smoking in the aircraft washroom.

2. The passenger threw his partially smoked cigarette into the waste basket and a fire resulted.

3. There was no pictorial "No Smoking" in the washroom.

Other:
-Nil-

SAFETY ACTION:

Action Taken:
Canadian Pacific Airlines (CPAL) has installed pictorials indicating "No Smoking" in all CPAL aircraft lavatories and has emphasized the need for flight attendants to be extra vigilant in checking for passengers smoking in washrooms.

✈ ✈ ✈ ✈ ✈

CANADIAN PACIFIC AIRLINES LTD.
BOEING 737-217 C-GCPS
VANCOUVER INTERNATIONAL AIRPORT, BRITISH COLUMBIA
10 MARCH 1985

REPORT NUMBER: 85-P54003 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1827 PST
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

During a visual approach, the speedbrake lever was selected to the flight detent position to reduce speed to flap extension speed and expedite descent. As speed decreased, flaps were lowered to 30 degrees and, simultaneously, the speedbrake lever was placed in the down detent. Immediately, a very strong airframe vibration developed, and the aircraft rolled rapidly to the left. Flaps were immediately selected up to 15 degrees, and the aircraft wings were levelled. The vibration continued and flaps were selected to five degrees. The vibration diminished, but was still strong.

The pilot orbited at 2,200 feet above sea level (asl). A visual inspection revealed that the number three left inboard spoiler was stuck in the fully extended up position. The pilot required 20 to 25 degrees of right aileron and some right rudder to maintain heading.

A decision was made to carry out an approachat 170 knots with 5 degrees of flap and to select 15 degrees of flap at the threshold. While on final approach at 1,500 feet asl and at an airspeed of 168 knots, the stick shaker activated. A go-around was initiated, and the speed was increased to 205 knots. A second approach was flown at 190 knots with 5 degrees of flap. The aircraft touched down smoothly at 185 knots.

The spoiler malfunction was caused by the twisted end of a locking wire which was used to secure a snubber valve in the flight spoiler actuator. This locking wire had broken off and jammed open the blowdown check valve, thus preventing the actuator from retracting.

Boeing was aware of this problem a year before this incident and had initiated a production change to incorporate improved procedures for installation of the lock wire in the snubber. In addition, actuator overhaul procedures were also amended. It would appear that the actuator in question had not been overhauled since the manufacturer had issued these changes

FINDINGS:

Cause Related:
1. The spoiler malfunction was caused by the interference of a piece of locking wire, which obstructed the operation of a check valve in the spoiler actuator.

Other:
-Nil

SAFETY ACTION:

Action Taken:
The manufacturer has implemented a production change to replace the safety wire with a three-tab washer. Additionally, the company has revised the Overhaul Manual making the tab washers the preferred retention method.

* * * * *

CANADIAN PACIFIC AIRLINES LTD.
BOEING 737-317 C-FCPIP
NEAR OTTAWA ATFL 340, ONTARIO
05 JUNE 1985

REPORT NUMBER: 85-P54015 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0735 EDT
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Not Available	Not Available
LAST 90 DAYS	Not Available	Not Available

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	6
PASSENGERS:	-	-	86

SUMMARY REPORT:

The aircraft was climbing through flight level (FL) 340 out of Montreal, when the number two engine (GE CFM 56–3) went to below idle power. Continuous ignition was selected on both engines, and the number two thrust lever was retarded to idle. The number one engine (GE CFM 56–3) then went to below idle power, and its thrust lever was retarded to idle. The number two engine instruments now indicated that the engine was operating again. Its thrust lever was advanced to an intermediate position then to maximum thrust, and the engine responded normally. The same indications and actions followed immediately with number one engine. The aircraft had descended to about FL 310 then climbed to FL 350. The flight continued uneventfully to Toronto.

As two similar engine difficulties had been experienced previously on Canadian Pacific Airlines (CP Air) Boeing 737-317 aircraft, CP Air voluntarily grounded their three aircraft immediately after this incident. An Airworthiness Directive (AD 85-05) was also issued by Transport Canada prohibiting further flight in the Boeing 737-317 aircraft until the problem had been rectified.

Boeing Company flight testing showed that, when using JP4 fuel, fuel pump operation was not reliable and led to engine loss of power or flame-out. However, the fuel pump was reliable when using Jet A fuel. On 07 June 1985, based on the test results, the Director of Airworthiness allowed CP Air to fly the aircraft, provided that only Jet A fuel was used and continuous ignition was selected on.

Subsequent testing showed that the Plessey Type 8240 Mark One, Two, and Three fuel boost pumps installed on the Boeing 737-300 series aircraft would not consistently produce adequate fuel flow and/or fuel pressure when using JP4 fuel, combined with high aircraft rates of climb, at high altitude.

Plessey has since produced a Mark Four pump that can be used without the fuel restriction.

FINDINGS:

Cause Related:
1. The fuel boost pumps were not capable of consistently producing adequate fuel at proper pressures to the engines when the aircraft was climbing at high altitude, and JP4 type fuel was being used.

Other:
-Nil-

* * * * *

CARGAIR LTD
DE HAVILLAND DHC-2MKI C-FIVA
PRESERVOIR TAUREAU, QUEBEC
28 MAY 1984

REPORT NUMBER: 84-Q40025 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0925 EDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7,000	2,200
LAST 90 DAYS	42	42

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

SUMMARY REPORT:

The pilot was flying four passengers to the Air Toro water aerodrome at Riservoir Taureau, Quebec. As the pilot was unfamiliar with this aerodrome, he made three passes in the vicinity to check for obstacles and to determine the wind direction. On approach to land, the aircraft struck and broke some hydro wires suspended across the approach path, damaging the aircraft windshield, wing leading edges and struts, and right stabilizer and elevator. The pilot landed the aircraft straight ahead, without further difficulty.

The hydro wires spanned the mouth of the bay where the water aerodrome is located and were approximately 125 feet above the surface of the water. The wires were not marked, and their presence was not indicated in the Water Aerodrome Supplement. The water aerodrome was licensed in July 1980 following a Transport Canada inspection. The hydro wires had been installed in May 1977.

The sky was overcast at the time of the accident. The diffuse light conditions produced by this overcast, combined with the water background, would have made it extremely difficult for the pilot to detect the wires.

FINDINGS:

Cause Related:
1. The power lines were not marked, and their location was not specified in the Water Aerodrome Supplement.

2. The light conditions and water background made detection of the wires difficult.

3. The pilot did not detect the power lines in sufficient time to avoid striking the wires.

Other:
-Nil-

SAFETY ACTION:

Action Taken:
Subsequent to this accident, the Water Aerodrome Supplement was amended to include a cautionary note regarding the power line that was struck by the accident aircraft. Furthermore, the CASB notes that the power line has since been removed.

* * * * *

ROBERVAL AIR SERVICES
DE HAVILLAND DHC-2MKI BEAVER C-FIPD
LAC PERE, QUEBEC
21 AUGUST 1984

REPORT NUMBER: 84-Q40060 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1315 EDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,200	1,000
LAST 90 DAYS	235	235

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	1	-	-

SUMMARY REPORT:

The pilot and passenger took off on a southerly heading from Lac Piri, Quebec. Shortly after lift-off, at a height of about 75 feet above the water, the aircraft turned to the left. The aircraft continued flying over the lake at a low altitude until the left wing struck a tree on a small island. The aircraft then turned further left until it was heading back toward the point where the pilot had begun his take-off run. At this time, the aircraft struck the surface of the water. Following the impact, the passenger unstrapped himself from the right front seat, climbed into the rear of the cabin, and handed the pilot a life-jacket. The passenger, who was on board the aircraft when it sank, drowned. The passenger did not appear to be injured as a result of the impact.

The aircraft emergency locator transmitter (ELT) switch was found in the OFF position. The passenger was found on the lake bed beside the aircraft. He held an uninflated life preserver in one hand and the life preserver battery pack (for the light) in the other. The passenger was familiar with this type of life preserver. The life preserver was considered serviceable, and it inflated normally when tested. The laboratory examination of the wreckage failed to reveal any structural or control system defects or failures prior to the aircraft striking the water.

It was calculated that the aircraft take-off run was approximately 700 feet. The distance from the point at which the aircraft became airborne, to the island, was approximately 1,000 feet, and, from take-off to impact with the water, the aircraft turned through 219 degrees.

The pilot reported that, after lift-off, the aircraft had suddenly banked to the left and that he had unsuccessfully attempted to level the wings using right aileron and rudder. He also reported that the aircraft continued in the left turn with 45 to 60 degrees angle of bank until it struck the tree and the water. As the flight controls appeared to be functioning normally, the cause of the pilot's reported uncommanded left turn could not be determined.

For undetermined reasons, the passenger was unable to don and inflate his life preserver.

The following laboratory reports were completed:
LP 281/84 -Structures and Control Systems Analysis;
and LP 304/84 - Life Preserver Model 701-117,
S/N D15717.

FINDINGS:

Cause Related:

1. After lift-off, the aircraft banked to the left for undetermined reasons and flew at low level over the lake.

2. During the turn, the aircraft struck a tree and, shortly thereafter, struck the surface of the water.

3. For undetermined reasons, the passenger was unable to don and inflate his life preserver.

Other:

1. The aircraft ELT switch was found in the OFF position.

SAFETY ACTION:

Action Taken:

The circumstances of this accident have been included in a Canadian Aviation Safety Board study, currently in progress, to examine the adequacy of existing regulations pertaining to life-support equipment for overwater flights.

* * * * *

WATSON LAKE FLYING SERVICES LTD.
CESSNA A185E CF-YIG
WATSON LAKE, YUKON 5 mi NE
24 NOVEMBER 1984

REPORT NUMBER: 84-W40078 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1525 PST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	10,000	3,000
LAST 90 DAYS	117	57

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

While flying en route to Watson Lake, the pilot heard a loud bang, and then the engine (Continental IO-520-D) stopped. The pilot force-landed the ski-equipped aircraft on a snow-covered highway; however, he was unable to negotiate a small curve in the road, and the aircraft slid off the side, struck a hard-packed snowbank, and nosed over.

The engine had been inspected 56 engine hours previously because of a cracked crankcase and excessive metal in the oil screen. The number two bearing was found seized on the crankshaft. The engine was repaired, and, after a magnetic particle inspection and a fluorescent penetrant inspection, both the crankshaft and the engine were certified as airworthy.

A Continental Engine Service Bulletin (M81-2 Rev. 1) dated 15 June 1981 recommended that an ultrasonic inspection be completed on the main bearing fillet area of the crankshaft each time it is removed for overhaul or for any other reason. The bulletin further stated that this inspection should be completed in addition to the magnetic particle inspection recommended in the overhaul manuals. It was found that the ultrasonic test could detect subsurface cracks which could not be detected using the standard magnetic particle method. There is no record that an ultrasonic inspection had been carried out when the engine was overhauled in September 1982, and it was not carried out after the bearing failure.

It was determined that the engine crankshaft had failed at the number two main bearing journal because of fatigue; the cause of the primary fatigue initiation could not be determined. However, it is likely that the failure was related to the previous seizure of the number two bearing. It is not known if an ultrasonic inspection would have detected the primary fatigue initiation.

The following laboratory report was completed:
LP 407/84 — Crankshaft Failure.

FINDINGS:

Cause Related:
1. The engine stopped when the crankshaft failed because of fatigue.

2. The aircraft nosed over during the forced landing when it struck a hard-packed snowbank.

Other:
1. The number two main bearing had been found seized and was repaired 56 engine hours prior to this occurrence.

2. An ultrasonic inspection had not been carried out as recommended by the manufacturer after the last engine overhaul and bearing failure 56 hours earlier.

* * * * *

PEM-AIR LTD.
PIPER PA-31-350 C-GPAM
PEMBROKE, ONTARIO
15 FEBRUARY 1985

REPORT NUMBER: 85-H50001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1650 EST
OPERATION: Regular Specific Point
DAMAGE: Substantial
PILOT LICENCE: Senior Commercial

PILOT HOURS:

	CAPTAIN		FIRST OFFICER	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	1,640	650	990	550
LAST 90 DAYS	300	300	300	300

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	1
PASSENGERS	-	1	7

HISTORY OF THE FLIGHT:

The passenger flight was operating under instrument flight rules (IFR) from North Bay to Montreal, with a stop at Pembroke. At 1638, the flight was cleared for an approach to the Pembroke Airport. Three miles to the west of the Pembroke non-directional beacon (NDB), the aircraft encountered visual meteorological conditions and the flight crew had the town of Pembroke and the airport in sight. The captain elected to carry out a visual approach to runway 35. He slowed the aircraft and descended in a circling turn in the area of the Pembroke NDB. The flight crossed the beacon inbound at 1,600 to 2,000 feet above sea level in descent. When the flight was about one mile on final, the crew requested that the runway lights be selected to full strength. Full flap was extended as the aircraft was over the approach lights. The approach continued until the main landing gear wheels ame into contact with the hard-packed snow, 194 feet short of the runway. The aircraft then nosed over as the nosewheel dug into the snow. The aircraft slid on its back and came to rest on the threshold of the runway. One crew member and one passenger were seriously injured.

PERTINENT INFORMATION:

There was no evidence of problems with the aircraft or its systems. The calculated weight and centre of gravity were within the prescribed limits at the time of the occurrence.

No weather observations were available for Pembroke Airport. The 1615 weather report for the Petawawa military aerodrome, which is located seven miles north of Pembroke, gave the weather as sky partially obscured with an overcast ceiling of 3,000 feet and visibility two miles in light sow showers. The crew was provided with the 1615 report prior to receiving clearance for the approach. Witnesses and the flight crew reported that the visibility was significantly reduced to the north of Pembroke Airport because of a heavy snow shower approaching from the northwest. Other witnesses indicated that snow was falling at the airport. The Petawawa weather at 1650 (the approximate time of the accident) was sky obscured, a 700-foot ceiling with a visibility of three-quarters of a mile in snow showers.

Runway 35 at Pembroke Airport is 5,000 feet long and 100 feet wide; the landing distance available was 5,000 feet. The runway was not equipped with a visual approach slope indicator system (VASIS). At the time of the accident, the runway was depicted with a length of only 3,999 feet in the Canada Flight Supplement and the Canada Air Pilot. (These publications were later amended to show the actual runway length.) The entire length of the runway was being maintained, but, at the time of the accident, it was covered with a thin layer of snow. The area short of runway 35 was a wide expanse of snow-covered fields which were relatively featureless.

The crew, who were based in Pembroke and familiar with the airport, indicated that they were not aware of anything unusual during the approach. They were attempting to land the aircraft very close to the approach end of the runway. The first indication of trouble was the impact short of the runway.

Whiteout is a condition where sky and ground conditions blend together making it difficult to distinguish a horizon reference. Snow falling over open areas is conducive to whiteout, and this condition makes it difficult for pilots to judge the altitude of their aircraft above ground.

During the investigation, it was determined that all passenger and crew seats and seat-belts were intact, with no evidence of failure. The aircraft was not equipped with shoulder harnesses for the crew. When the aircraft came to rest, the passengers were suspended by seatbelts; some passengers suffered contusions when the aircraft's upper structure was crushed. The rear cabin door was opened by the impact forces, and those near the door were able to exit quickly. These passengers assisted in the evacuation of the other passengers. The crew members were extricated by municipal fire department personnel.

During the impact, the aircraft battery was ejected clear of the wreckage. Despite the presence of leaking fuel and oil, there was no fire.

ANALYSIS:

The crew was not able to judge the height of the aircraft above the snow-covered terrain. This was due to the whiteout conditions present at the Pembroke Airport during the visual approach. The snow-covered runway and the undershoot area would have blended in with the falling snow, thus making it difficult to assess the proper approach path. Attempting to land the aircraft right at the threshold of the runway reduced the margin of error. The aircraft struck the snow-covered terrain when this small error margin was exceeded.

VASIS equipment had not yet been installed at the time of the accident. As a result, the pilot did not have the visual cues it would have provided regarding glide path information. The deep snow caused the aircraft to nose over when the gear dug in.

Although a high potential existed for post-impact fire, none occurred. This was likely a result of the departure of the aircraft battery and the snow-covered impact area. The absence of fire resulted in a successful evacuation of the aircraft occupants.

FINDINGS:

Cause Related:

1. The weather and terrain conditions made it difficult to accurately judge the flight path.

2. The crew allowed the aircraft to land short of the threshold.

3. The snow in the impact area caused the aircraft to nose over when the nosewheel dug in.

Other:

1. More serious injuries were avoided by the fortuitous absence of post-impact fire.

2. The runway was not equipped with a VASIS at the time of the accident.

SAFETY ACTION:

Action Taken:

Since this occurrence, a VASIS has been installed at both ends of the runway at the Pembroke Airport.

✈ ✈ ✈ ✈

* * * *

EDZO AIR LIMITED
CESSNA A185F C-GXAO
MARION LAKE, NORTHWEST TERRITORIES
6 mi NW
28 FEBRUARY 1985

REPORT NUMBER: 85-W50008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1615 MST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	7,500	1,500
LAST 90 DAYS	107	75

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

A few minutes after take-off, as the aircraft was crossing a frozen lake, the pilot experienced difficulty in maintaining visual flight. Visibility was reduced in snow, blowing snow, and low cloud, and there was a lack of contrast between the sky and the lake surface. The pilot descended and then turned 180 degrees to the left in an attempt to regain adequate visual references. After completion of the turn, the pilot checked his instruments and realized that the aircraft was banked 15 to 20 degrees to the right. The aircraft struck the lake while the pilot was attempting to return the aircraft to level flight.

The investigation did not reveal any pre-accident aircraft malfunction or failure. The Arctic Weather Centre in Edmonton indicated that conditions in the crash area would have been overcast ceilings based at 800 to 1,500 feet above ground level (agl), light snow, winds from the northwest at 15 gusting to 25 knots, and visibility two to six miles, briefly reduced to one-half mile in blowing snow. The pilot reported that the visibility at take-off was two to three miles and, at the time of the crash, less than one mile. The pilot knew that the weather conditions at take-off were marginal; prior to take-off, he was informed by radio that the weather at his destination, 24 minutes away, was "okay". Although the pilot held a valid instrument rating, he had not considered resorting to instrument flight when he lost visual reference with the ground. The aircraft was equipped with front-seat shoulder harnesses, but neither the pilot nor the front-seat passenger was using them; both suffered head injuries at impact.

The pilot continued flight into deteriorating conditions to the point where he lost visual reference with the ground and lost control of the aircraft.

FINDINGS:

Cause Related:

1. The pilot continued flight into deteriorating weather conditions.

2. The pilot lost visual reference with the ground and, as a result, lost control of the aircraft.

Other:

1. The front-seat shoulder harnesses were not used.

* * * * *

SHARP WINGS LTD.
CESSNA A185F C-GFPJ
WILLIAMS LAKE, BRITISH COLUMBIA
28 MARCH 1985

REPORT NUMBER: 85-P54008 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1605 PST
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	12,240	4,560
LAST 90 DAYS	92	36

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The ski/wheel equipped aircraft landed on the ice surface of Williams Lake and stopped about 100 yards from shore to wait for another ski-equipped aircraft to land. The left ski broke through the ice, and the pilot added power to pull out; however, the aircraft broke through the ice and came to rest with the engine under the water, the wings about a foot above the ice, and the aft cabin area resting on the ice. The propeller was damaged because of contact with the ice, and the engine, radios and instruments were water damaged. There was some minor airframe damage.

The pilot had walked over the area the morning of the occurrence, and he overflew the area prior to landing. He knew the surface was soft because of the warm day, but he judged the ice condition to be safe. The ice was generally about 11 inches thick, but there was a soft spot where the aircraft had stopped.

FINDINGS:

Cause Related:

1. The pilot landed on a lake and stopped where the ice surface was not strong enough to support the weight of the aircraft.

Other:

-Nil-

* * * * *

NORTHWINDS NORTHERN INC.
CESSNA U206D C-GEGI
TADOULE LAKE, MANITOBA
22 APRIL 1985

REPORT NUMBER: 85-C50017 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1635 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	312	105
LAST 90 DAYS	193	105

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

On arrival over Tadoule Lake, the pilot circled the ice strip to determine the ice and wind conditions. On touchdown, in a light cross-wind, the aircraft drifted to the right, and the right wing struck a snowbank.

The strip was unlicensed, and there were no facilities from which the pilot could obtain a report on conditions. He reported that the temperature was three degrees Celsius and that the ice surface was slippery. The aircraft was travelling at about 25 knots when it struck the snowbank.

The investigation determined that the cross-wind condition resulted in the aircraft drifting on the slippery runway. Although the pilot attempted to correct the drift, the flight controls were not effective at the low airspeed, and braking action was ineffective on the slippery surface condition.

FINDINGS:

Cause Related:

1. Because of the slippery ice surface and cross-wind, the pilot was unable to maintain directional control on landing, and the aircraft struck a snowbank.

2. The flight control surfaces were not effective because of the low airspeed.

3. Braking action was ineffective on the slippery ice runway.

Other:

- Nil -

* * * * *

PACIFIC RIM AIRLINES LTD.
PIPER PA-23 C-FRGG
PORT ALBERNI, BRITISH COLUMBIA
13 MAY 1985

REPORT NUMBER: 85-P54010 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1300 PDT
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	450
LAST 90 DAYS	200	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	5

SUMMARY REPORT:

The aircraft landed on a 3,000-foot turf runway. During the landing roll, the nose gear collapsed, causing minor airframe and propeller damage.

The investigation did not reveal any pre-incident aircraft malfunction or failures. However, company mechanics later determined that the two link assembly nose gear locks were bent and badly worn. In this condition, the nose gear could not be locked in the down position. It was not determined what had caused the locks to bend.

FINDINGS:

Cause Related:
1. The nose gear collapsed on landing because the nose gear lock link assembly was worn and bent.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

ALBERTA CENTRAL AIRWAYS
CESSNA T207 C-GRAU
GREW LAKE, ALBERTA
12 JUNE 1985

REPORT NUMBER: 85-W50028 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1145 MDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,350	400
LAST 90 DAYS	120	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The aircraft was on a charter flight with two passengers on board and had climbed through 3,200 feet, when the engine began to miss and lose power. The aircraft could no longer maintain altitude, so the pilot turned back toward his point of departure and attempted to restore the engine power. The fuel boost pump was selected to "Hi", the fuel tank selector was switched, the mixture was selected to full rich, and the throttle was pumped in and out. All attempts to restore the engine power failed, and the pilot attempted a forced landing on a pipeline right-of-way. During the landing, the nosewheel dug into the soft muskeg and was torn off. The aircraft came to rest in a nose-down attitude.

Teardown of the turbocharger revealed that the impeller vanes were damaged. The damage was caused by the alternate-air doorlatch which had broken loose and entered the turbocharger.

The engine had not been producing full power for about one week, and attempts to correct the fault had been unsuccessful.

Cessna had issued a service information letter (SE80-12) to owners advising them to inspect the magnetic latch for excessive wear and to replace the latch with one made of stainless steel. A 100-hour inspection was carried out six days prior to the accident, but no defects in the latch were noted. The magnetic latch to the alternate-air door had loosened and had been ingested by the turbocharger sometime prior to the accident flight. This led to reduced engine power output which worsened with time. The engine problem was tolerated by the operator when the reason for the continued power loss was not determined.

The aircraft flight manual specifies no procedure for a turbocharger failure. When the pilot experienced the power loss, he performed the normal emergency actions by turning on the fuel boost pump to "Hi" and by increasing the mixture to rich. By doing so, the engine was flooded with fuel, causing a total failure. If he had not performed these actions, the engine would have continued to run as a normally aspirated engine at a reduced power setting sufficient to maintain flight.

FINDINGS:

Cause Related:
1. The alternate-air door magnetic latch detached and entered the turbocharger at some time prior to the accident flight.

2. The turbocharger impeller was damaged, and, as a result, the engine would not develop full power.

3. The loss of the latch and the damage to the turbocharger were not detected during the 100-hour inspection carried out six days before the accident.

4. The flight was attempted with a known engine defect.

5. The aircraft flight manual specifies no procedure for a turbocharger failure.

6. The pilot, unaware of the nature of the power loss, turned on the fuel boost pump to "Hi" and increased the mixture to rich, resulting in a total engine power loss.

7. The aircraft was damaged when a forced landing was attempted on soft ground.

Other:
-Nil-

* * * * *

KENORA AIR SERVICE LTD.
BEAVER DHC-2 CF-JEI
MARGOT LAKE, ONTARIO
15 JUNE 1985

REPORT NUMBER: 85 C50039 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1145 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,660	172
LAST 90 DAYS	76	76

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-		1
PASSENGERS	-	-	4

SUMMARY REPORT:

The aircraft was chartered to fly four fishermen and their gear to Margot Lake. Weather conditions at the lake were deteriorating, and the pilot reported a ceiling of 700 feet above ground level and a flight visibility of three miles in rain and fog. The winds were estimated to be from an easterly direction at eight knots. The pilot landed the aircraft in a southerly direction in the narrow section of the lake. Touchdown was at a higher than normal speed, and the pilot was unable to bring the aircraft to a stop before it struck the rocky shoreline.

The lake is approximately one and one-half miles long and has a narrow section in the middle. The pilot elected to land on the narrow section of the lake in reduced visibility so as to keep the shoreline in view. He reported that, during the approach, the visibility was reduced in moderate rain to the extent that he had to fly by looking out the side window. He also reported that his ground speed seemed to be increasing during the final landing phase and the aircraft would not settle onto the water. It is possible that there was a slight tail wind component which caused the aircraft to touch down farther down the lake than the pilot had anticipated and at a higher than normal ground speed.

FINDINGS:

Cause Related:
1. The aircraft was landed in reduced visibility on a narrow section of the lake.

2. The pilot did not use all of the lake that was available for landing and, as a result, the aircraft struck the shoreline.

Other:
- Nil -

* * * * *

RED LAKE AIRWAYS LTD
DE HAVILLAND DHC-3 C-FDDX
LITTLE VERMILION LAKE, ONTARIO
20 JUNE 1985

REPORT NUMBER: 85 C50043 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1030 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,000	1,000
LAST 90 DAYS	70	55

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

About 30 minutes after take-off, the float-equipped Otter suffered a partial power loss, and smoke began to pour out of the top of the engine cowling. The engine (Pratt and Whitney R1340-SIH1-G) began to surge and a short time later seized. The pilot decided to make an emergency landing on a lake he had just overflown; however, the aircraft struck trees short of the lake.

The investigation revealed that the engine failed because of an exhaust valve failure in the number two cylinder. The reason for the valve failure was not determined. When the engine seized, there was no suitable forced landing area within gliding distance.

FINDINGS:

Cause Related:
1. The engine failed because of an exhaust valve failure in the number two cyclinder.

2. There was no suitable landing area within gliding distance when the engine seized.

Other:
-Nil-

* * * * *

MONTREAL FLYING CLUB
GRUMMAN AA-5B C-GVLW
DRUMMONDVILLE AIRPORT, QUEBEC
01 APRIL 1984

REPORT NUMBER: 84-Q44040 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1055 EST
OPERATION: Flying Club Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	32
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW			1
PASSENGERS		-	-

SUMMARY REPORT:

On landing at Drummondville Airport, the aircraft bounced on touchdown. The pilot overshot, continued around the circuit, and landed without further incident. After shutdown on the ramp, the pilot discovered that the propeller tips had been damaged.

The evidence indicates that damage to the propeller occurred on the first landing. It is likely that the pilot landed the aircraft in a nose-down attitude with little or no round-out prior to touchdown. This incorrect landing technique resulted in the propeller contacting the runway.

FINDINGS:

Cause Related:
1. The pilot employed an incorrect landing technique which caused the propeller to strike the runway on touchdown.

Other:
-Nil-

* * * * *

PACIFIC WESTERN AIRLINES
BOEING 737-275 C-GJPW
ABBOTSFORD AIRPORT, BRITISH COLUMBIA
24 JUNE 1984

REPORT NUMBER: 84-P44010 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1250 PDT
OPERATION: Commercial Non-Revenue
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	14,000	9,000
LAST 90 DAYS	40	40

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	5
PASSENGERS	-	-	-

SUMMARY REPORT:

The flight originated at Vancouver International Airport for the purpose of recurrent training for three company pilots. Circuit training was being conducted at Abbotsford Airport, and, on the seventh landing of the flight, the two right main tires deflated and disintegrated. Some tire fragments were ingested into the right engine, causing minor compressor damage.

The aircraft had been landed six times on this flight; two were touch-and-go, and four were full-stop landings, with backtracking for subsequent take-offs. On the incident landing, which was to be a touch-and-go, the first officer, flying from the right seat, inadvertently moved the reverse thrust levers to the reverse thrust position then immediately moved them back to the forward thrust position. Once reverse thrust is selected, company rules require that a full-stop landing be made. The captain, who was in the left seat, applied the brakes. At about 80 knots, a slight vibration started, and a couple of seconds later, the crew heard a"pop". Both right tires deflated and disintegrated during the landing roll. The previous landing had been a full-stop, and the brakes had been used on all the full-stop landings.

Examination of the right wheel assemblies revealed that all the thermal plugs had blown out because of heat and pressure buildup. The brakes showed signs of extreme heat and excessive wear for the number of cycles since overhaul.

The series of landings were conducted in such a short time that the heat generated in the wheel assemblies and tires during braking and ground travel did not have time to dissipate in flight. The accumulated heat caused the thermal plugs to blow out. No individual landing was hard enough to cause tire failure, nor was excessive brake used on any landing.

The following laboratory report was completed:
LP 220/84 - Main Wheel Tires Boeing 737-200.

FINDINGS:

Cause Related:
1. Repeated landings, braking, and taxiing resulted in overheated brakes and tires, which caused the thermal tire plugs to blow out.

2. The deflated tires disintegrated during the landing roll, and tire fragments caused minor right engine compressor damage.

Other:
- Nil -

SAFETY ACTION:

Action Taken:
Pacific Western Airlines Ltd. has informed all its Boeing 737 check and training pilots of the factual information regarding this incident. Furthermore, check and training pilots have been made more aware of the need to use minimal wheel braking and to allow for maximum brake cooling during touch-and-go flight operations.

* * * * *

WHITE'S AIRCRAFT SERVICES LTD.
CESSNA R172K C-GQTA
LAC VICEROY, QUEBEC
10 AUGUST 1984

REPORT NUMBER: 84-Q40056 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1720 EST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	88	8
LAST 90 DAYS	34	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was practising solo landings and take-offs in order to obtain his float endorsement. He was under the supervision of the company's chief instructor. The water surface was glassy during the training period. As the aircraft landed for the fifth time, the right float struck the water, and the aircraft bounced. When it set down again, the right float sank into the water, and the aircraft nosed over.

The pilot stated that he became disoriented during the approach because he was tired. However, since the training was being performed under glassy water conditions, it is also probable that the lack of visual references contributed to the pilot's disorientation.

FINDINGS:

Cause Related:
1. The pilot lost control of the aircraft as it was landing on a glassy water surface.

2. The pilot, who was tired, became disoriented; furthermore, there were no visual references.

3. The pilot was relatively inexperienced for a flight under glassy water conditions.

Other:
-Nil-

* * * * *

LAURENTIDE AVIATION LIMITEE
CESSNA 172M C-GUFO
LES CEDRES, QUEBEC
19 AUGUST 1984

REPORT NUMBER: 84-Q40059 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1640 EDT
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	9,000	1,000
LAST 90 DAYS	285	90

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

During take-off after a touch-and-go landing, the aircraft began to swing to the left. The instructor pulled on the stick to get the aircraft airborne more quickly. During rotation, he felt that the nosewheel shock absorber was extending much too far. Once in the air, the pilot noted that there was a problem with the nose gear. He made an approach with 40 degrees of flap, and the aircraft landed at a speed between 35 and 40 knots. When the speed decreased, and the nosewheel touched down, the aircraft veered sharply to the left and nosed over at the edge of the runway.

The shock absorber on the nose gear oleo strut had extended too far, because the upper bolt on the nosewheel torque link connecting rod had failed and fallen out. An examination of the fracture surface indicated that the failure was partly the consequence of a high-cycle low-stress fatigue crack. The surface of the bolt shank close to the fracture showed deep corrosion pitting caused by inadequate lubrication.

The following laboratory report was completed:
LP 268/84 - Upper Connecting Rod Retaining Bolt.

FINDINGS:

Cause Related:

1. Directional control of the aircraft was lost due to the failure of the upper connecting rod retaining bolt.

2. The bolt failure was caused by a high-cycle low-stress fatigue crack originating in the numerous corrosion pits on the bolt shank.

3. The corrosion pitting was caused by inadequate lubrication.

Other:
-Nil-

* * * * *

STRATFORD AIRWAY LTD.
PIPER PA23-250 AZTEC C-GGNA
STRATFORD MUNICIPAL AIRPORT, ONTARIO
18 MARCH 1985

REPORT NUMBER: 85-O54041 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 EST
OPERATION: Specialty Flying Training
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,000	2,500
LAST 90 DAYS	40	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The commercially owned and operated aircraft took off from Stratford on a local training flight. The pilot-in-command was to do a progress check on a pilot undergoing multi-engine conversion training. The trainee's regular instructor was also on board in a rear seat. On the first attempt to lower the landing gear, it would not move to the down-and-locked position.

The crew recycled the landing gear handle and made numerous attempts to lower the gear, using both backup and emergency alternatives. When the emergency gear lowering cable was pulled, the landing gear indicated down and locked; however, several minutes later the gear again indicated unsafe. Further attempts to achieve a down-and-locked indication were unsuccessful. The pilot elected to retract the landing gear fully and land wheels-up.

The investigation of the landing gear extension system determined that a poppet valve in the hydraulic power pack was unseated by foreign material. A small piece of metal from the circlip used to hold the hydraulic hand pump piston assembly together was identified in the valve seat.

The flaps were selected on final approach, after the landing gear had been extended using the emergency extension system. Shortly thereafter, the landing gear indicated unsafe again. The owner's manual contains a caution not to hydraulically actuate the landing gear or flaps after an emergency gear extension, until the extension system has been returned to its normal condition.

FINDINGS:

Cause Related:

1. When the landing gear lever was selected down, the landing gear would not fully extend due to foreign material in the hydraulic power pack.

2. Contrary to the owner's manual, flaps were selected after a successful emergency landing gear extension.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

BROCKVILLE FLYING CLUB
PIPER PA28-140 C-GBYT
BROCKVILLE AIRPORT, ONTARIO
19 MARCH 1985

REPORT NUMBER: 85-O50019 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1945 EST
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	66	33
LAST 90 DAYS	7	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

On base leg, the pilot reduced the power to about 1800 rpm to lower the airspeed for the approach. As he neared the runway, he attempted to reapply power and found that the throttle was stuck about one inch from the idle position. The pilot landed on a rough wet grass field about 800 feet short of the threshold, and the aircraft was substantially damaged.

Examination of the throttle control showed that the throttle control cable guide tube had failed, causing the throttle control rod to bind. The guide tube failed in overload. There was no evidence of pre-cracking or of a progressive failure of any kind. Without the additional power, the pilot had insufficient airspeed and altitude to reach the runway.

The following laboratory report was completed:
LP 56/85-Throttle Control Cable.

FINDINGS:

Cause Related:

1. The throttle control cable guide tube failed, thus restricting throttle movement.

2. Without additional power, the pilot had insufficient airspeed and altitude to reach the runway threshold.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

NIGHTHAWK FLYING CLUB
CESSNA 150M C-GEUW
IROQUOIS FALLS, ONTARIO
9 APRIL 1985

REPORT NUMBER: 85-O50025 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1400 EST
OPERATION: Flying Club Training
DAMAGE: Destroyed
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	19	16
LAST 90 DAYS	13	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student was carrying out a flapless landing on his second solo flight. On touchdown, the aircraft bounced; the pilot pulled back on the control column, and the aircraft pitched nose-up. The pilot lowered the nose slightly to improve his forward visibility and then realized that the aircraft was drifting towards the side of the runway. He applied power, but the aircraft would not climb. The aircraft continued to drift off the side of the runway towards a stand of trees. The pilot attempted a shallow turn at a slow speed away from the trees. The aircraft stalled in the turn, and the left wing dropped striking the snow-covered ground. The aircraft turned through 180 degrees, cartwheeled, and came to rest right-side-up.

The bounce recovery technique employed by the inexperienced student pilot was incorrect and pitched the aircraft nose up, thus reducing the forward visibility from the cockpit. While the nose was pitched up, the pilot inadvertently allowed the aircraft to drift to the left off the edge of the runway. Because of the nose-high attitude of the aircraft, the power required to climb away exceeded the power available, and, when the slow speed turn was attempted, the aircraft stalled.

FINDINGS:

Cause Related:

1. During the bounce recovery, the inexperienced student pilot did not maintain pitch and directional control of the aircraft.

2. The aircraft stalled after the pilot attempted a slow speed turn.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

DRYDEN FLIGHT TRAINING CENTRE LTD.
CESSNA 152 C-GYAG
DRYDEN, ONTARIO 4 mi NW
17 APRIL 1985

REPORT NUMBER: 85-C50016 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2001 EST
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:

	PILOT-IN-COMMAND		STUDENT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	1,000	150	140	Unknown
LAST 90 DAYS	150	7	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The instructor and his student were carrying out a night training flight and were at 2,200 feet above ground level, when the aircraft's engine (Lycoming 0-235-L2C) suddenly lost power. The instructor took control of the aircraft but was unable to restart the engine. A forced landing was carried out on a frozen lake. During the roll-out, the nosewheel contacted a depression in the ice, and the nose gear was sheared off.

An examination of the carburettor at an overhaul facility revealed that a foreign object was blocking the main fuel nozzle. Laboratory analysis indicated that the substance was silicone rubber. A typical application for such a material would be as an adhesive or sealant; however, the substance is not used in the fuel system of this aircraft. The investigation was unable to establish the source of the foreign object, but it appeared to be external to the engine's fuel system.

The silicone rubber was ingested by the engine and blocked the carburettor's main fuel nozzle. As a result, the engine lost power due to fuel starvation. The pilot's only choice for a forced landing site was the frozen lake, and, as it was night, he could not see the depression in the ice. The following laboratory report was completed: LP 94/85 - Carburettor Fouling Cessna 152, C-GYAG.

FINDINGS:

Cause Related:

1. Silicone rubber from an unidentified source blocked the main fuel nozzle and caused the engine to lose power.

2. During the forced landing, the nose gear struck a depression and collapsed.

Other:
- Nil -

✈ ✈ ✈ ✈ ✈

CANADIAN IFR RATING INC.
BEECH D95A C-GTIL
VANCOUVER INTERNATIONAL AIRPORT, BRITISH COLUMBIA 15 mi E
24 APRIL 1985

REPORT: 85-P54006 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1300 PST
OPERATION: Specialty Flying Training
DAMAGE: Minor
PILOT LICENCE: Not Available

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft, which was at 4,000 feet, in cloud, was being vectored to runway 26 at Vancouver, when turbulence was encountered. The pilot requested a turn away from the turbulence. Permission was granted, and as the pilot commenced the turn, the aircraft was struck by lightning. The strike broke the nose cone which tore away from the aircraft and broke off the number one very high frequency (VHF) radio antenna. The pilot selected emergency on the transponder, descended below cloud, and landed uneventfully at Boundary Bay Airport. He contacted Boundary Bay tower prior to landing, using the number two VHF radio.

There were heavy clouds in the area, but, at low altitude, ground-based radar was not effective in picking out the clouds because of ground clutter, and the aircraft was not equipped with a weather radar.

FINDINGS:

Cause Related:
1. The aircraft was struck by lightning while flying in cloud.

Other:
-Nil-

* * *

ATHABASKA AIRWAYS LTD.
DE HAVILLAND DHC-2 MK III C-FOEF
LA RONGE WATER AERODROME, SAKATCHEWAN
12 MAY 1985

REPORT NUMBER: 85-C50038 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1458 CST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Airline Transpor

PILOT HOURS:

	PILOT-IN-COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	3,200	165	2,633	97
LAST 90 DAYS	200	3	142	62

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The float plane, equipped with a single swing-over type control column, was being utilized by two company pilots for a local training flight. The trainee occupied the left seat, and the supervisory pilot occupied the right.

After the trainee had completed several take-offs and landings using various flap configurations, he attempted a simulated short-field, obstacle-clearance landing. Planning to land close to the far shore of a small tree-covered island, the trainee extended full flap and reduced the airspeed to 80 mph. The aircraft cleared the shoreline at about 50 feet above water level at a high rate of descent. The trainee added power; however, the application was too late to arrest the descent; the aircraft landed heavily, in about the correct attitude, and bounced back into the air. An overshoot was carried out, during which the supervisory pilot noticed that the right float attachment structure was damaged. The company was notified and rescue boats were dispatched. The crew donned life-jackets and switched seats. The supervisory pilot then carried out a precautionary landing from the left seat. As the aircraft settled on the water, the right float struts collapsed. The attempted manoeuvre was a relatively exacting one, entailing a steeply angled final approach and precise power handling. Although the trainee did have time on type, he had never flown a Turbo Beaver on floats. The supervisory pilot was not in a position to assume control of the aircraft, as he did not have direct access to a control column.

On final approach, the trainee allowed the rate of descent to become excessive and recovery action was initiated too late to preclude a hard landing.

FINDINGS:

Cause Related:
1. While on final approach, the crew allowed the aircraft rate of descent to become excessive.

2. The trainee pilot applied power to arrest the descent; however, the application was too late to prevent the aircraft from landing heavily.

Other:
- Nil -

* * *

CHEYENNE FLIGHT SERVICES LTD.
PIPER PA-38-112 TOMAHAWK C-GRQL
HIGH RIVER AIRPORT, ALBERTA
1 JUNE 1985

REPORT NUMBER: 85-W50024 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1410 MDT
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	38	24
LAST 90 DAYS	13	11

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

After completing a dual flight with an instructor on board, the student pilot took off solo to practise circuits. The wind at the time was 90 degrees off the runway from the right at 10 knots. The first circuit and landing were normal. On the second landing, the touchdown was normal, but shortly thereafter during the landing roll, the aircraft became airborne again, rolled to the left, and then landed heavily on the nosewheel, off the side of the runway. The nosewheel broke off, and the aircraft nosed over.

The student had successfully completed several landings in similar wind conditions, both dual and solo, prior to the accident. During the landing roll, the student did not maintain the required control inputs to prevent the aircraft from becoming airborne again. Once airborne, the pilot allowed the aircraft to turn to the left in the cross-wind, and the aircraft landed heavily on the nosewheel.

FINDINGS:

Cause Related:
1. The pilot did not maintain control of the aircraft during the landing roll, with a cross-wind from the right.

Other:
-Nil-

* * * * *

TORONTO AIRWAYS LIMITED
CESSNA 150M C-GEIE
TORONTO/BUTTONVILLE AIRPORT, ONTARIO
28 JUNE 1985

REPORT NUMBER: 85-O50051 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1345 EDT
OPERATION: Specialty Flying Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	15	15
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot had just completed 35 minutes of dual instruction and was on his first solo circuit of the day. This was his second solo landing; he had completed his first solo the day before the accident. During the approach, there was a cross-wind from the right varying between 30 to 60 degrees and gusting from 10 to 15 knots. On touchdown, the aircraft bounced back into the air, and the pilot corrected by moving the control column forward. The aircraft touched down a second time and again bounced into the air. The pilot attempted to recover by applying power; however, the aircraft drifted left and touched down hard, just to the left of the runway. The nosewheel mount failed, and the aircraft slid to a stop.

When the aircraft bounced during the landing attempt, the inexperienced student pilot was unsuccessful in his efforts to recover aircraft control and complete the landing. At the time of the occurrence, the wind was variable, and the pilot did not compensate for the cross-wind during the attempted recovery. The failure of the nosewheel mount was due to a heavy touchdown.

FINDINGS:

Cause Related:
1. The aircraft bounced on touchdown, and the inexperienced student pilot was unable to recover from the bounced landing.

2. The wind was variable in direction and occasionally gusty.

Other:
-Nil-

* * * * *

CESSNA 172M C-GHWJ
MCKENZIE, BRITISH COLUMBIA 10 mi S
03 JULY 1985

REPORT NUMBER: 85-P50021 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2011 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	20	20
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The solo student pilot selected the aircraft's flaps down on approach for a practice precautionary landing. On completion of the exercise, 800 feet above the ground, he selected the flaps up, but they did not retract. The pilot then elected to land in the field he had chosen for his practice approach. Shortly after touchdown, the aircraft's nosewheel dug into the soft soil of the marsh-like field, and the aircraft nosed over.

A loose electrical connection in the flap control circuit caused the flap retraction failure.

The pilot made the decision to land on an unprepared surface rather than to return to the airport, because he did not know if the aircraft would continue to fly with the flaps fully down. Considering the experience level of the pilot and the lack of aircraft performance information for flight in the maximum drag configuration, his decision to land was appropriate. However, the chosen landing area was soft, and, as a result, the aircraft nosed over.

FINDINGS:

Cause Related:
1. The flaps failed to retract because of a loose electrical connection in the flap control circuit.

2. The inexperienced student pilot chose to attempt a precautionary landing on an unprepared surface.

3. The soft landing surface caused the aircraft to nose over.

Other:
-Nil-

* * * * *

PROTECTION DE LA FORET
CESSNA 172M C-GAXD
ST-VALLIER, QUEBEC
23 JUNE 1983

REPORT NUMBER: 83-Q30038 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1200 EDT
OPERATION: Specialty Aerial Control
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	297	5
LAST 90 DAYS	12	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was cruising when the engine (Lycoming 0-320-E2D) began to vibrate severely. In an attempt to identify the problem, the pilot followed normal cabin procedures. He also applied carburettor heat, but, since there was no improvement, he decided to carry out an emergency landing on a narrow, dirt road. When he reduced power, the engine vibrations were less severe. On landing, the left landing gear wheel ran into a grassy area, and the aircraft drifted to the left. A short time later the left main wheel crossed a shallow roadside ditch, and the nosewheel collapsed. The aircraft then swung sharply to the right, and the propeller and left wing sustained damage.

An inspection of the engine revealed that the number one cylinder exhaust valve had broken. A laboratory examination found that the valve stem had initially fractured close to the valve head. Because of major damage after the failure, it was impossible to establish the exact mode of failure. There was no indication of a technical malfunction or manufacturing defect associated with the exhaust valve failure.

The following laboratory report was completed:
LP 414/83 - Exhaust Valve and Piston Failure.

FINDINGS:

Cause Related:

1. Severe engine vibrations were experienced when the aircraft was in cruise.

2. The vibrations were caused by the failure of the number one cylinder exhaust valve stem.

3. The mode of failure was not determined.

4. During the landing roll, the aircraft crossed a ditch.

Other:
-Nil-

* * * * *

AMOS AVIATION
PIPER PA-23-250 AZTEC C-GUKC
ROUYN, QUEBEC
26 APRIL 1984

REPORT NUMBER: 84-Q40017 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1710 EDT
OPERATION: Specialty Aerial Inspection, Reconnaissance, and Advertising
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	578	12
LAST 90 DAYS	15	12

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

When the landing gear was retracted during the second flight of the day, the crew noticed an odour of burning rubber. The pilot recycled the gear which helped to eliminate the odour. On completion of a three-hour flight, a normal approach was carried out, and the aircraft was landed. When the nosewheel touched the runway, the aircraft swung sharply to the left. The pilot raised the nose to reduce the load on the nosewheel, but, as the airspeed decreased, the nose dropped. When the nosewheel touched down again, the aircraft again swung sharply to the left, and the nose gear collapsed.

An inspection of the nose gear assembly indicated that the connecting rod centre bolt was missing. Although the connecting rod was damaged, the bolt hole was not deformed, thus indicating that the bolt was missing before the landing gear collapsed. The company's towing procedures were identical to those in many other companies: to avoid damaging the connecting rod, it was disconnected and then reconnected after completion of the towing operation.

The individual in charge of towing operations confirmed that the bolt had been replaced after this manoeuvre. It was also discovered that the company normally used an unauthorized quick-release pin instead of the cotter pin provided to secure the bolt. Quick-release pins were also discovered on other aircraft owned by the company, and these were deformed and in poor condition.

The quick-release pin broke, which allowed the bolt to back off and then fall out. It then became impossible to control the nosewheel. When it touched down on the runway, the nosewheel was turned to the left, thus placing an additional load on the nose gear and causing it to fail.

FINDINGS:

Cause Related:

1. The centre bolt of the nose gear connecting rod fell out during flight.

2. An unauthorized quick-release pin had been used to secure the centre bolt.

3. The pin broke allowing the nut to back off and the bolt to fall out.

4. The nose gear collapsed because of overload resulting from the crosswise position of the wheel on touchdown.

Other:

1. The quick-release pins discovered on other aircraft were deformed and in poor condition.

* * * * *

SICKLE LAKE LODGE LTD
CESSNA U206F C-GRBK
LAC BROCHET, MANITOBA
30 JUNE 1984

REPORT NUMBER: 84-C44024 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1430 CDT
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	483	160
LAST 90 DAYS	292	160

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing the float-equipped aircraft in a 10-to 15-knot wind on one-foot-high waves. As the aircraft came off the step during the landing run, it was in an abnormally nose-low attitude. The pilot taxied the aircraft to shore without further incident.

On landing, the forward strut on the right float bent and allowed the front of the float to rotate upward. As well, the rear leg of the step leading to the aircraft cargo door over the right float broke in two near the upper end of the leg. The leg is not part of the float supporting structure.

It appears that the weakened strut bent when subjected to high loads during the landing on rough water. The step leg broke as a result of the forces created on it when the strut bent. The pilot and the aircraft owner both considered that the forward strut had been weakened, because it was continually exposed to hot exhaust gases from the engine, but this could not be confirmed.

FINDINGS:

Cause Related:
1. The strut and step leg failed as a result of high loads imposed during a landing on rough water.

Other:
1. It was not determined whether the forward strut had been previously weakened by exposure to hot engine exhaust gases.

* * *

CESSNA 172 C-GRNU
EDMONTON MUNICIPAL AIRPORT, ALBERTA
03 AUGUST 1984

REPORT NUMBER: 84-W40052 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2015 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	80	6
LAST 90 DAYS	4	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot was returning to land after a local sightseeing flight. The aircraft was high on approach and landed hard about half-way down the runway. On touchdown, the aircraft bounced several times with the amplitude increasing with each bounce. The pilot applied power in an attempt to go around, but the aircraft failed to clear a wire security fence at the perimeter of the airport. The aircraft went through the fence and then slid sideways into a metal light standard.

Prior to this flight, the pilot had not flown this aircraft type for over a year, and she arranged for a type check to build confidence before flying with passengers. During the check, which included numerous touch-and-go landings, the pilot initially had difficulty with approaches and, consequently, was required to overshoot from several landing attempts. The instructor stated that by the end of the trip, the approaches were acceptable, and the landings were firm but controlled.

The pilot stated that she was uncertain of recovery techniques from a bounce of the magnitude experienced and was therefore hesitant in the application of power to go around. This delay, and the fact that the aircraft was landed half-way down the runway, resulted in there being insufficient distance for the aircraft to clear the fence.

FINDINGS:

Cause Related:
1. The pilot misjudged the approach and landed long and hard.

2. The aircraft bounced, and the pilot was slow in the application of recovery techniques.

Other:
-Nil-

* * * * *

CESSNA 172 C-GDJO
LEJEUNE, QUEBEC
04 SEPTEMBER 1984

REPORT NUMBER: 84-Q40068 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1230 EDT
OPERATION: Flying Club Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	123	123
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

After departing Charlo, New Brunswick for Sorel, the pilot encountered adverse weather conditions for the second day in succession. On the previous day, he had returned to land at Charlo; on this occasion, however, he continued toward his destination. During the flight he unsuccessfully attempted several times to contact the Mont-Joli Flight Service Station (FSS). After about one hour into the flight, conditions were still worsening, and the pilot decided to make a precautionary landing in a nearby field. On landing, the nosewheel became bogged down, the oleo broke, and the aircraft slid about one hundred feet before coming to rest.

Prior to this flight, the pilot had received a complete weather briefing at the Charlo FSS. He could in general expect extremely unsettled conditions along his route, with ceilings between 1,000 and 4,000 feet above sea level (asl) and visibility as low as half a mile in places.

The planned route (Charlo-Quibec-Sorel) crossed a mountain range which runs from the northeast to the southwest. The average elevation is between 1,200 and 1,800 feet asl, with peaks rising to 2,300 feet asl.

As expected, conditions worsened as the flight continued westward. The pilot pressed on, however, in the belief that he was experiencing a local phenomenon and in the hope that conditions would improve.

The reduced visibility and low cloud base forced him to descend in order to remain in visual flight. Since he was overflying a mountainous region, two main problems resulted from this decision. First, he was unable to maintain an appropriate and safe altitude above the ground, and, second, his communications range was considerably reduced. Because he could not contact the surrounding FFSs, he was unable to check whether the conditions would in fact improve. By the time the pilot realized that it would be too dangerous to continue the flight, the conditions had deteriorated to such an extent that he did not dare reverse course or make a diversion. The only possible option was a precautionary landing. Since little time was available, he selected a nearby field. Unfortunately, the area being overflown was rugged country, and the fields were bumpy and waterlogged. On landing, the surface caused the aircraft to decelerate rapidly, the nosewheel became bogged down, and the nose gear oleo was unable to take the load.

FINDINGS:

Cause Related:

1. The pilot did not recognize the dangers associated with overflying mountainous regions in marginal weather conditions.

2. The pilot continued the flight despite weather conditions justifying a much earlier course reversal or diversion.

3. By postponing his decision, the pilot was forced to land in an unsuitable area.

4. The surface of the field was too irregular and waterlogged for a safe landing.

Other:
-Nil-

* * * * *

J.C. LEASING
GULFSTREAM COMMANDER 690D N 990JC
TORONTO/LESTER B. PEARSON INTERNATIONAL AIRPORT, TORONTO, ONTARIO
12 FEBRUARY 1985

REPORT NUMBER: 85-O54902 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1910 EST
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Airline Transport (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	900
LAST 90 DAYS	150	150

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

After completing a charter flight from Nashville, Tennessee, the aircraft landed and cleared the runway. The pilot then contacted the ground controller who issued taxi instructions to the pilot which included the use of taxiway Romeo. The pilot proceeded as directed, and, just after the aircraft entered taxiway Romeo, the left propeller struck snow on the taxiway, damaging the propeller and engine.

Heavy snow, which had been falling throughout the day at the airport, had changed to rain. The most recent field condition report issued at 1802 eastern standard time indicated that taxiway Romeo had been ploughed and sanded. Although taxiway Romeo had been ploughed, the clearing of adjacent taxiways just prior to the incident had resulted in snow being blown onto Romeo. The ground controller was unaware of this fact.

FINDINGS:

Cause Related:
1. During snow removal operations on areas adjacent to the cleared taxiway, the left propeller of the aircraft struck snow which was inadvertently blown back onto the taxiway.

2. The field condition report indicated that the taxiway had been ploughed and sanded.

Other:
- Nil -

* * *

CESSNA U206B, N1182B
KING CITY, ONTARIO 5 mi NW
7 MARCH 1985

REPORT NUMBER: 85-O50901 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2320 EST
OPERATION: Unknown
DAMAGE: Substantial
PILOT LICENCE: Unknown

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	Unknown	Unknown	Unknown
PASSENGERS	Unknown	Unknown	Unknown

SUMMARY REPORT:

An overflying aircraft picked up an emergency locator transmitter (ELT) signal at 2330 EST; however, no aircraft was reported overdue. As foggy weather prevented an air search, a ground search was initiated the next day. The search discovered an aircraft which had crashed into trees located on rising ground just west of highway 400 near King City, Ontario. The aircraft had struck the trees in a flat attitude. There was no sign of the occupants except for two sets of footprints leading from the aircraft to highway 400. The Canadian Aviation Safety Board (CASB) has not been able to determine who the occupants were. In addition, the aircraft has not been claimed.

That night both the ceiling and visibility were low in rain and fog. An aircraft was observed flying low near the scene just prior to reception of the ELT signal. No flight plan had been filed, nor was the aircraft's point of departure or destination determined. It is possible that the pilot planned to land at either King City or Maple Airport located to the south of the accident site. The aircraft was registered to a dummy company located in the United States. The circumstances surrounding the accident remain a mystery, and the investigation has been turned over to the police.

FINDINGS:

Cause Related:

1. The aircraft, while flying in poor weather conditions, struck trees located on rising ground.

Other:

1. The identity of the occupants remains unknown.

2. The aircraft was registered to a dummy company located in the United States.

* * * * *

AIR MONT-LAURIER INC
CESSNA 210L C-GVBD
MANIWAKI, QUEBEC
23 MARCH 1985

REPORT NUMBER: 85-Q50008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1040 EST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	60
LAST 90 DAYS	125	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The aircraft took off from runway 03 at Maniwaki, Quebec on a charter flight. During the initial climb, at about 50 feet agl, the engine misfired several times. The pilot performed the routine checks and continued climbing to 400 feet agl, then turned about, and did a downwind landing on runway 21. After a landing roll-out of 3,075 feet, the aircraft came to rest off the left side of the runway, about 22 feet short of the threshold of runway 03. The main landing gear of the aircraft was substantially damaged, and the nose gear collapsed when the aircraft struck some snowbanks at the edge of the runway.

Before the flight, the aircraft had been parked outdoors for four days on a piece of ground that placed the right wing in a low attitude. When the pilot arrived at the airport, he put about 60 gallons of fuel in the tanks and returned to the same tie-down point. In the pre-flight inspection, about one hour later, the pilot bled a quantity of water from the left wing tank; the fuel at the other bleed points was clear. The pilot selected the right tank for take-off. Runway 21 is 5,000 feet long and has a 0.88 per cent downslope. The weight of the aircraft was estimated at approximately 3,500 pounds, which is 7.4 per cent under the maximum allowable take-off weight. The pilot stated that when the engine misfired, he did not have sufficient runway remaining on which to land.

After the landing, the brakes were applied, and both failed simultaneously. Inspection of the braking system revealed that the pads were worn to the point where the retaining rivets had damaged the discs. Upon impact with the hardened snow, the fuselage fuel filter was damaged, and a large quantity of fuel leaked out. An inspection of the engine and fuel system was performed; however, neither the cause of the loss of power nor the misfiring could be determined.

The last 50-hour inspection had been performed on 30 September 1984. The Certificate of Airworthiness had expired on 07 March 1985. The aircraft should have been inspected within the 60-day period before the expiry date. This procedure includes a brake inspection. Because the aircraft was in a right-wing-low attitude in the parking area, the accumulation of water in the right wing was not at the drainage point, and it could not be bled. During the initial climb, this water leaked into the fuel system and caused the engine to misfire. When the brakes were applied after landing, the worn pads and discs increased the pistons' travel, and this caused the pressure seals to move into a rough, soiled area in the cylinders. This produced a hydraulic leak in both independent systems, and the brakes failed. The condition of the brakes could have been detected and rectified during an inspection of the aircraft to validate its certificate.

FINDINGS:

Cause Related:

1. Water in the fuel system caused the motor to misfire several times during the initial climb.

2. Faulty brakes caused by worn pads and discs prevented the aircraft from stopping on the runway.

3. The inspection required to validate the Certificate of Airworthiness would have revealed the poor condition of the aircraft brakes, and they could have been repaired.

Other:

-Nil-

* * * * *

ATHABASKA AIRWAYS
BEECH 90 KING AIR C-GQDD
WATERBURY LAKE, SASKATCHEWAN
14 APRIL 1985

REPORT NUMBER: 85-C50015 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0920 CST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:

	PILOT-IN-COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	4,320	1,066	8,700	N/A
LAST 90 DAYS	161	41	222	64

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	2	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was on an instrument flight rules (IFR) flight from Saskatoon to an ice strip on Waterbury Lake, Saskatchewan. The crew made an en-route descent until the ground was visible and then flew a track to the ice strip. The camp was not located, so they flew to a known reference point and began to follow an ice road which led to the strip. Because of the low ceilings and reduced visibility, the crew flew the aircraft between 300 and 500 feet above ground level (agl). About eight miles from the strip, the aircraft struck the ice surface of Waterbury Lake. The aircraft was not fitted with shoulder harnesses; both pilots received lacerations to the head.

Normal company procedure was to fly to the area and, when cleared by air traffic control, to descend out of controlled airspace. Ground contact was established at about 2,000 feet agl, and the descent was continued until the visibility improved. The ground was kept in sight, but the cloud base was reported to be ragged with the visibility variable.

The reported weather for the area included ragged ceilings between 400 and 1,000 feet agl with visibilities ranging from 1 to 10 miles in light snow-showers and fog. Such conditions are conducive to whiteout, especially when flying over a large, white, featureless lake. During the flight, the pilots had agreed to carry out an overshoot if whiteout conditions were encountered or if visual contact with the ground was lost.

While following the ice road, both pilots were attempting to maintain visual contact with the ground. Neither pilot was monitoring the flight instruments, and, as a result, they did not observe the aircraft's descent and loss of terrain clearance when the whiteout conditions were encountered.

The aircraft was normally equipped with a radar altimeter, but it had been removed for repair.

Had shoulder harnesses been available and worn, the injuries sustained by the pilots may have been reduced.

FINDINGS:

Cause Related:

1. The crew attempted visual flight in marginal weather conditions.

2. The crew continued the flight when whiteout conditions were encountered.

3. In an attempt to maintain visual reference, both pilots were looking outside the aircraft, and neither was monitoring the instruments.

4. The aircraft struck the ice-covered lake after whiteout conditions were encountered.

Other:

1. The aircraft's radar altimeter had been removed for repair.

2. Shoulder harnesses were not installed in the aircraft.

* * *

NORTHWAY AVIATION
CESSNA 180 C-FHKB
SASAGINNIGAK LAKE, MANITOBA
22 APRIL 1985

REPORT NUMBER: 85-C54003 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0902 CST
OPERATION: Charter
DAMAGE: Minor
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,900	1,000
LAST 90 DAYS	150	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot carried out a normal landing on an unprepared frozen lake surface. As the aircraft slowed to less than five miles per hour, both skis broke through the ice, and the cockpit rapidly filled with water. The left door, the normal exit for the pilot, was blocked by ice; however, the pilot was able to escape through the right-hand door.

The pilot reported that, during the previous night, it had rained in the area. It would appear that the rain had rendered the ice unsuitable for air operations. It is unknown if the pilot had inspected the ice surface before landing on the lake.

FINDINGS:

Cause Related:
1. The ice surface of the frozen lake could not support the weight of the aircraft.

Other:
-Nil-

* * * * *

PERIMETER AVIATION LTD
BEECH BARON B-55 C-GCIK
FORT FRANCES, ONTARIO
15 MAY 1985

REPORT NUMBER: 85-C50030 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1837 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,700	1,410
LAST 90 DAYS	300	300

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was conducting an instrument approach to a 4,000-foot-long runway in conditions of reduced visibility. The pilot made a higher than normal final descent profile to land. The visual approach slope indicator system (VASIS) was inoperative, and the undershoot area was bordered by trees. The aircraft touched down faster than recommended, approximately 1,500 feet along the runway. Braking was applied, but the aircraft did not decelerate, and there was insufficient runway available to carry out an overshoot. The aircraft travelled 180 feet off the end of the runway and was substantially damaged when the landing gear became mired in deep mud.

Heavy rain had passed through the area just prior to the approach sequence, leaving the runway water covered.

There were no reports of braking action or runway surface conditions available to the crew before landing. There was no evidence of pre-occurrence mechanical or structural discrepancies.

Both main tires showed signs of hydroplaning. Performance figures showed that on a paved, level, dry surface, a distance of 1,180 feet is required to stop this aircraft. According to the Aeronautical Information Publication (AIP) Canada, when hydroplaning occurs, the stopping distance is impossible to predict accurately and is significantly greater than the distance required to stop on dry pavement.

The pilot flew a higher than normal final descent profile to ensure clearance over trees. Contributing to the high approach and the high airspeed were the conditions of reduced visibility and the inoperative VASIS. As a result of the high approach and the high airspeed, the aircraft touched down long. The surface conditions were such that hydroplaning was encountered, and the pilot was unable to stop the aircraft on the runway remaining.

FINDINGS:

Cause Related:
1. The pilot, in conditions of reduced visibility and with the VASIS inoperative, flew a higher than normal approach to ensure obstacle clearance.

2. The pilot, as a result of the high approach, landed long with a higher than normal airspeed.

3. The pilot encountered hydroplaning on landing and was unable to stop the aircraft on the runway remaining.

Other:
-Nil-

* * * * *

KEYMAWUN LODGE LTD.
GRUMMAN G21A C-GRCZ
RED LAKE, ONTARIO
17 MAY 1985

REPORT NUMBER: 85-C50028 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1920 CDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	18,000	3
LAST 90 DAYS	150	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was being flown from a nearby water base to the Red Lake Airport. Earlier in the day, the pilot had received a check-out on type, which included both land and water operations. On approach to land, the pilot reported that he lowered the landing gear manually and noted visually that the landing gear struts were extended and that there were three green gear lights illuminated. He reported a normal touchdown in a strong cross-wind; after a short landing roll, the right main gear collapsed, causing substantial damage to the fuselage.

Inspection of the landing gear system revealed that it was serviceable, and there were no mechanical discrepancies noted. The salvage engineer reported that there were indications that the landing gear was not fully down and locked on touchdown. However, the pilot reported that all the proper procedures had been carried out, and the landing gear was down and locked.

To protect the landing gear retracting mechanism from possible damage that might occur from excessive loads, there are three safety bolts that are designed to shear before the mechanism can be damaged. These bolts are not strong enough to support the aircraft with the landing gear partially retracted.

Manufacturer stress analyses of these bolts show that failure can occur during take-off or landing only when there is an abnormal side load with no vertical component. During the investigation, the safety bolts were found on the runway, and they had been sheared.

There is a possibility that the right landing gear did not fully extend. There is also a possibility that the strong cross-wind imposed a side load on the safety bolts, causing them to shear.

FINDINGS:

Cause Related:
1. The right gear collapsed after touchdown for undetermined reasons.

Other:
-Nil-

* * *

FOOTHILLS FLYING SERVICE
GRUMMAN G-164A C-GVPQ
HIGH RIVER, ALBERTA 8 mi SW
21 MAY 1985

REPORT NUMBER: 85-W50018 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0935 MDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	300
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of a Grumman Agcat was engaged in applying granular chemicals to some farm fields. During a right-hand pull-up, after the second swath, the engine quit abruptly. Unable to restart the engine, the pilot selected a field straight ahead for a forced landing. When the pilot spotted a ditch obstructing the touchdown area, he began a left turn to another field. During the turn, the aircraft stalled, struck the ground, and overturned.

An internal examination of the engine verified that the engine was capable of normal operation. Metal flakes found in the oil screen were traced to the cam ring drive gear. Laboratory analysis indicated that the gear had been improperly plated to compensate for wear.

No residual fuel was found in the tanks, lines or filters. A soil sample taken from the area under the fuel cap and vent tubes indicated that no fuel residue was present. It was determined that the aircraft was using purple farm fuel instead of aviation gasoline.

Before take-off, the pilot reported that he had added about 20 gallons of fuel which brought the indicated quantity on the fuel gauge up to three-quarters full. However, the pilot did not visually check the fuel quantity. Laboratory analysis of the fuel gauge determined that the gauge was sticking and, consequently, gave erroneous readings, and there would not have been as much fuel in the tanks as the pilot believed. The owner calculated that the tanks would have been almost empty on return from the previous flight. The refuelling facility does not maintain records of fuel used. The lack of residual fuel and the examination of the engine indicated that the engine lost power as a result of fuel exhaustion.

When the pilot spotted the ditch in the touchdown area, he attempted a steep turn at low altitude and airspeed, causing the aircraft to stall. There was insufficient height above ground in which to effect a recovery, and the aircraft struck the ground. A more suitable landing area was available to the pilot.

The following laboratory reports were completed: LP 134/85 - Throttle Mixture Control; LP 135/85 - Fuel Gauge; LP 137/85 - Fuel Sample; and LP 138/85 - Cam Drive Gear.

FINDINGS:

Cause Related:

1. The fuel quantity gauge was giving erroneous readings, and the pilot did not visually check the fuel quantity prior to the flight.

2. The engine lost power as a result of fuel exhaustion.

3. The aircraft stalled during a steep low-level turn, during the pilot's attempt to reach a landing site.

Other:

1. The cam ring drive gear had been improperly plated to compensate for wear.

2. The aircraft was using purple farm fuel instead of the recommended aviation gas.

✈ ✈ ✈ ✈ ✈

CESSNA 172M C-GNKI
TORONTO HARBOUR, ONTARIO
4 JUNE 1985

REPORT NUMBER: 85-O50040 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1130 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	170	8
LAST 90 DAYS	46	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot of a float-equipped aircraft began the take-off run in the direction of several small sailboats. Prior to the aircraft becoming airborne, the left wing struck the mast of a sailboat, and the aircraft swung to the left. The pilot cut the power, and the aircraft stopped.

The area that was available for take-off is large enough that an unobstructed path could have been selected. As well, the pilot did not manoeuvre the aircraft during the take-off run in order to avoid the boat.

According to the evidence, the pilot underestimated the take-off distance required and did not select an appropriate take-off path.

FINDINGS:

Cause Related:

1. The selected take-off path was not appropriate.

2. The pilot did not manoeuvre the aircraft to avoid the boat.

Other:

- Nil -

✈ ✈ ✈ ✈ ✈

AGRO AIR SPRAY LTD.
CESSNA A188B C-GRVT
LUMSDEN, SASKATCHEWAN 6 mi SW
07 JUNE 1985

REPORT NUMBER: 85-C50037 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1900 CST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	210	14
LAST 90 DAYS	120	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During the take-off run from a 15-foot wide dirt road, the pilot lost directional control of the aircraft. The aircraft swerved three times and then departed the road to the left. It entered a bordering ditch, and the right landing gear failed.

There were no reported aircraft malfunctions. There was a slight cross-wind from the right at less than five knots.

The pilot reported that the aircraft swerved left and that he probably overcontrolled in trying to correct for the first and subsequent swerves. He did not attempt to reject the take-off, and the engine was at full power until the aircraft entered the ditch. When the aircraft struck the ditch, the right landing gear failed.

The pilot attempted to take off from a road that was so narrow there was no margin for error; even a slight swerve would necessitate immediate and accurate flight control inputs to maintain the aircraft on the road.

FINDINGS:

Cause Related:

1. The pilot selected an unsuitable area for take-off.

2. The pilot lost directional control of the aircraft during the take-off run, and the aircraft left the road.

3. When the aircraft struck the ditch, the right main gear failed.

Other:
-Nil-

* * * * *

TORONTO AIRWAYS LIMITED
PIPER PA-28-181 CHEROKEE C-GGMT
MARKHAM AIRPORT, ONTARIO
8 JUNE 1985

REPORT NUMBER: 85-O50043 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1600 EDT
OPERATION: Specialty Recreational Flying
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	88	26
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

While the aircraft was en route from Orillia to Buttonville, Ontario, the aircraft engine (Lycoming 0-360-A4M) began to vibrate. When the aircraft was overhead Markham Airport, the vibration became severe, and the pilot shut down the engine. The pilot carried out a forced landing on the 2,045-foot runway at Markham. On landing, the aircraft bounced several times and continued off the end of the runway, coming to rest in a small ditch.

The engine vibration was caused by the failure of a cylinder assembly which had separated from the engine block. Examination of the engine revealed that the two through bolts attaching the cylinder assembly to the block had become loose and initiated fatigue failure in the remaining bolts. The loose bolts were not properly torqued during a top overhaul 23 hours prior to the accident.

The planning and execution of the forced landing was such that the touchdown was long and at a higher than normal speed, and, as a result, the pilot was unable to stop the aircraft before it overran the short runway.

The following laboratory report was completed:
LP 156/85, Cylinder Head Failure - Piper Archer, C-GGMT.

FINDINGS:

Cause Related:

1. Severe engine vibrations, caused by two improperly torqued cylinder assembly attachment bolts and by subsequent fatigue failure of the remaining bolts, compelled the pilot to force-land the aircraft.

2. The pilot landed the aircraft long and at a higher than normal speed and, as a result, was unable to stop the aircraft on the available runway, and the nosewheel struck a ditch.

Other:
-Nil-

* * * * *

CLARM-AIRE LIMITED
CESSNA 172M C-GFVO
MORIN VILLAGE AIRSTRIP, ONTARIO
15 JUNE 1985

REPORT NUMBER: 85-O50044 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1505 EDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,000	Unknown
LAST 90 DAYS	17	17

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was returning to land after completing a spotting flight for three forestry spray aircraft. The runway was bordered by trees approximately 50 feet high and located 200 feet back from the runway. The surface wind was from the right at 12 knots gusting to 15 knots and turbulent conditions existed throughout the area in the lower few hundred feet above ground. The pilot flew the approach at an airspeed slightly higher than normal. The aircraft touched down, rolled a short distance on the runway and suddenly became airborne again. Before the pilot could react, the aircraft dropped back onto the runway, and the nosewheel broke off. As the aircraft skidded down the runway, the broken end of the nose gear strut dug into the runway, and the aircraft nosed over.

The tall trees lining the runway created unpredictable turbulence and downdrafts in the strong wind conditions. Because of this, the pilot flew the approach at a higher than normal airspeed. At the start of the landing roll, a wind gust caused the aircraft to become inadvertently airborne. Before the pilot could react, the aircraft's nosewheel slammed back into the runway damaging the nose gear.

FINDINGS:

Cause Related:

1. After the aircraft became inadvertently airborne the nose gear was damaged on landing in turbulent and gusty conditions.

Other:
-Nil-

* * * * *

SMOKEY BURN AG-AIR
CESSNA A188B C-GWWB
CARROT RIVER, SASKATCHEWAN
15 JUNE 1985

REPORT NUMBER: 85-C50040 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1100 CST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	600	250
LAST 90 DAYS	100	65

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot commenced a take-off from a soft grass strip. The aircraft lifted off normally but would not climb above a few feet, and the pilot elected to reject the take-off. However, on touchdown, there was insufficient space remaining to stop the aircraft; it overran the runway, continued through a fence and came to rest in a ditch.

The pilot reported that, at the time of the take-off, the weather was warm and humid with light gusty winds, and the aircraft's weight and centre of gravity were within the prescribed limits. Actual weather conditions at the time of the accident, as observed by weather rewas 21 degrees Celsius, dew point 11 degrees Celsius, and the wind was light and variable.

FINDINGS:

Cause Related:

1. Unable to establish the aircraft in a climb, the pilot rejected the take-off.

2. There was insufficient runway remaining to stop the aircraft.

Other:

-Nil-

* * * * *

CESSNA 172RG CUTLASS C-GOPZ
QUESNEL, BRITISH COLUMBIA 19 mi SW
16 JUNE 1985

REPORT NUMBER: 85-P50017 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 PDT
OPERATION: Specialty Recreational Flying
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	670	25
LAST 90 DAYS	150	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The aircraft was on a local sightseeing flight, when it began to vibrate so violently that the pilot thought he might lose control of the aircraft. He transmitted a Mayday call and made a forced landing in a field. The ground was soft, and, on landing, the nosewheel dug in and broke off. An inspection of the wreckage revealed that a seven-inch portion of one propeller blade was missing.

The propeller had failed because of a fatigue crack which had started at the leading edge of the blade. The structural integrity of the blade was thus weakened and resulted in the failure of that blade in flight. The site of the fatigue crack initiation coincided with a point on the blade where the propeller had been repaired by dressing previous damage along the leading edge. During this repair, a fold of metal was formed and not detected prior to returning the propeller to service. There were indications that the propeller had been dressed on at least two occasions; however, the investigation was unable to determine on which occasion the inadequate repair occurred.

The Mayday transmission was received by a local helicopter firm which dispatched a helicopter to the accident site. The radio transmission was also received by the Quesnel Flight Service Station (FSS); however, only part of the message was received by this agency as the call was weak. An adjustment of the squelch control on the FSS radio was required to improve the signal reception; however, the FSS operator was unable to make this adjustment as the squelch control is located in a different room than the transceiver.

The following laboratory report was completed:
LP 160/85 - Propeller Blade Failure.

FINDINGS:

Cause Related:

1. The propeller blade failed in flight because of fatigue crack propagation, which started as a result of improper propeller repair.

2. The soft ground in the landing area caused the nosewheel to dig in and break off.

Other:

1. The FSS operator was unable to receive fully the pilot's emergency transmission as the squelch control was remote from his work station.

* * * * *

THOUSAND LAKE AIRWAYS
NOORDYNE UC-G4AS CF-GYY
BISHOP LAKE, ONTARIO
25 JUNE 1985

REPORT NUMBER: 85-C50045 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1330 EDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,300	80
LAST 90 DAYS	100	80

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was on the final leg of a three-stage camp resupply flight. Take-off was being conducted from a shallow lake in three-foot swells, which were caused by strong and gusting easterly winds. Because of these conditions, the pilot did not select flap for departure. Just after becoming airborne and while approaching the shoreline, the aircraft encountered violent wind gusts. The aircraft struck the water in a near level attitude; however, the left float buckled after striking the crest of a wave, and the aircraft rolled over onto its back.

The pilot reported that, prior to the flight, there was a hole in the left float above the water-line and that the same float had a slow leak on the bottom near the keel. There were no reported engine or control malfunctions, and the aircraft was apparently within weight and balance limits.

The aircraft became airborne and was a few feet above the water when it encountered severe downdrafts and wind gusts. Because the airspeed had decayed, the pilot's flight control inputs were ineffective in preventing the aircraft from descending to the water.

The aircraft rolled over when the first one-third of the float buckled as it entered a three-foot swell. The reported float defect did not contribute to this accident.

FINDINGS:

Cause Related:
1. The aircraft encountered severe wind gusts and downdrafts after it became airborne at a low airspeed.

2. The left float struck a three-foot wave which caused the float to buckle and the aircraft to roll left and come to rest in an inverted attitude.

Other:
-Nil-

* * * * *

SCHMIT AERO SERVICE
AYRES THRUSH S2R-600C-GPNG
DAVIDSON, SASKATCHEWAN
28 JUNE 1985

REPORT NUMBER: 85-C50046 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1500 CST
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,100	400
LAST 90 DAYS	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Shortly after the spray-equipped aircraft took off, the enginelost power. As the airspeed decayed, the pilot lowered the noseat or near the stall speed and force-landed the aircraft in a field off the end of the runway.

Examination of the engine revealed that the engine fuel pump rotor vanes had corroded to the point that the pump shaft sheared. This aircraft had been in an accident one year ago, and, in the process of rebuilding the aircraft, a new engine was installed. Accessories from the old engine, including this fuel pump, were installed on the engine without being inspected.

The following laboratory report was completed:
LP 278/85 - Fuel Pump Corrosion.

FINDINGS:

Cause Related:
1. The engine failure was caused by a failure of the fuel pump shaft.

2. Accessories from the old engine were installed on the new engine without first being inspected.

Other:
-Nil-

* * * * *

NORTHWINDS NORTHERN INC.
CESSNA U206 D C-GEGI
THOMPSON AIRPORT, MANITOBA
01 JULY 1985

REPORT NUMBER: 85-C50049 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1413 CDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	460	250
LAST 90 DAYS	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot and his instructor had completed a training exercise in the local area and were returning to the airport to carry out touch-and-go landings. Shortly after lift-off, following their first landing, the engine (Continental IO-520-F) lost power. The instructor reduced the throttle setting, and some engine power was regained momentarily. However, a ground impact could not be avoided, so he closed the throttle and stalled the aircraft onto the ground. After touchdown, the nosewheel dug into the ground,and the aircraft nosed over.

The cause of the power loss was not determined during an examination of the engine. When the aircraft was repaired, the engine appeared to run normally.However, the engine lost power again during take-off for a test flight. An examination following the second power loss revealed that the air induction hose had become delaminated and had collapsed when the engine was at full power on take-off.When the hose collapsed, it blocked the air flow into the engine.

The manufacturer requires an inspection of the air induction hose after every 200 hours of operation. The engine had been operated for 704 hours since its last overhaul. The required inspections were carried out, but hose delamination had not been detected.

The engine lost power on take-off because the delaminated hose blocked the air flow into the engine when the engine was at full power. The delamination was not detected prior to the accident and was difficult to find during the subsequent investigation.

FINDINGS:

Cause Related:

1. A delaminated air induction hose collapsed when the engine was at full power and caused the power loss.

2. The aircraft nosed over on impact following an engine power loss shortly after lift-off.

3. The required inspections were carried out; however, the hose delamination was not detected.

Other:
-Nil-

* * * * *

NORTHERN MANITOBA OUTFITTERS LTD.
CESSNA U206F C-GRNC
PRINCESS HARBOUR, MANITOBA
03 JULY 1985

REPORT NUMBER: 85-C50051 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2155 CDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	416	217
LAST 90 DAYS	217	217

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was landing at a northern provincial airstrip. The clay-surfaced runway, oriented east/west, is 4,000 feet long and about 50 feet wide. The wind was from the northwest at 5 to 10 knots with occasional gusts. During the flare, the aircraft drifted left and touched down on the side of the strip. The left wheel sank in the soft clay, and the aircraft was pulled further left. The nosewheel struck a rock at the runway edge, and the nose gear assembly collapsed.

The runway at Princess Harbour is operated by the Province of Manitoba to provide service to the residents of the nearby settlement. The clay surface becomes extremely slippery when wet. No information regarding the aerodrome is published in the Canada Flight Supplement.

Recent heavy rain in the area resulted in the runway being very soft and slippery. The pilot was familiar with the airstrip, and, even though he was aware of the strip's condition, he attempted to land. During the flare, a gust of wind caused the aircraft to drift off the centre line of the runway, and the pilot could not maintain directional control.

FINDINGS:

Cause Related:
1. During the flare, a gust of wind caused the aircraft to drift, and the pilot could not maintain directional control.

Other:
-Nil-

* * * * *

CHAMPION 7GCBC C-FABI
DESCHAMBAULT, QUEBEC
13 APRIL 1983

REPORT NUMBER: 83-Q30018 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1740 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11	121
LAST 90 DAYS	21	21

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

After overflying the village of Deschambault, the pilot prepared to land the aircraft on a straight section of road close to his cousin's garage, about five kilometres from the village. The aircraft made a final approach with flaps retracted in a cross-wind from the left; it touched down on the right wheel, about 400 feet ahead of a transmission line across the road. The aircraft then bounced on the left wheel and veered to the right. The pilot initiated an overshoot, and, as the aircraft climbed, it struck signboards, poles, and a group of telecommunication wires. As it collided with the wires, the aircraft veered to the left and lost speed, then fell into a field where it came to rest in a nearly vertical attitude.

The pilot indicated that, as he was overflying the village, the engine progressively lost power. He stated that he applied carburettor heat and decided to make a precautionary landing close to his cousin's garage, because his cousin would be able to establish the reason for the failure. Examination of the aircraft did not reveal any pre-accident technical malfunctions. At a temperature of four degrees Celsius and a dew point of minus three degrees Celsius, the weather conditions were conducive to severe carburettor icing in descent and moderate icing in cruise. After the wheels touched down, the pilot pulled up to avoid the obstacles ahead, and the engine produced sufficient power to climb.

The reason for the reported power loss could not be determined. However, the weather conditions were conducive to carburettor icing. The precautionary landing area selected by the pilot was unsuitable. After the wheels touched down, the aircraft bounced and veered to the right because of the cross-wind. When the pilot saw the large number of obstacles ahead, he attempted an overshoot, but the aircraft struck some wires and fell to the ground.

FINDINGS:

Cause Related:
1. The reason for the reported power loss was not determined.

2. The precautionary landing area selected by the pilot was unsuitable.

Other:
1. The weather conditions were conducive to carburettor icing.

* * * * *

PIPER PA-20 N1970A
FORT WARE, BRITISH COLUMBIA 6 mi N
07 AUGUST 1983

REPORT NUMBER: 83-P30905 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	5
LAST 90 DAYS	30	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was about 25 miles north of Fort Ware, British Columbia en route from Ingenika to Watson Lake, when oil started covering the windshield. The pilot turned around to land at Fort Ware. Ten miles out of Fort Ware, the oil pressure gauge was reading zero, and the pilot decided to land immediately. During the attempt to land in a clearing, the aircraft struck trees short of the clearing and crashed.

On take-off out of Chilliwack the previous day, the propeller oil seal blew out; the windshield quickly became coated with oil, and most of the engine oil was lost. After landing, the seal was reinstalled; however, oil was still slowly leaking from the seal. The flight continued to Springhouse Airpark where a new propeller oil seal and filter gasket were installed. The accident occurred approximately four engine hours later.

The engine was stolen before it could be examined, and therefore the cause of the oil leak in the propeller seal area could not be determined.

The aircraft struck the trees during the landing attempt because the pilot had difficulty seeing through the oil-covered windshield.

FINDINGS:

Cause Related:
1. The aircraft experienced an oil leak of undetermined origin in the propeller oil seal area.

2. Because of the loss of oil pressure, the pilot elected to attempt a precautionary landing in a clearing.

3. The aircraft struck trees during the landing attempt, because the pilot had difficulty seeing through the oil-covered windshield.

Other:
-Nil-

* * * * *

BELLANCA SCOUT C-GKZG
ARTLAND, SASKATCHEWAN 13 mi ESE
09 DECEMBER 1983

REPORT NUMBER: 83-C30118 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	950	Unknown
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft, with the pilot and one passenger on board, was engaged in a low-level operation in an area frequented by big game. While at cruise speed at an altitude of 300 to 500 feet above ground, the aircraft rolled left out of control and crashed. The pilot was killed on impact.

Laboratory analysis of the wooden left wing spar revealed that there was compression damage to the tension side of the spar. This damage had occurred in a previous accident where the aircraft nosed over on the ground. At that time, the spar had been weakened considerably just outboard of the wing strut, which is the region of maximum wing bending. The outer panel of the left wing failed upwards in flight, and, as a result, the aircraft rolled to the left and descended to the ground out of control. Further research has produced documentation of two other in-flight wing failures of Bellanca Scout aircraft. As in the case of C-GKZG, these aircraft had also been involved in accidents where the aircraft overturned on the ground. In all three cases, the wing failures were similar. The following laboratory reports were completed: LP 453/83 - Wing Attach Fitting Bellanca Scout 8GCBC, and LP 133/84 - Break-Up Analysis Bellanca 8GCBC Wing.

FINDINGS:

Cause Related:
1. The left wing front spar had sustained undetected damage in a previous accident.

2. The weakened left wing failed in flight, causing a complete loss of control.

Other:
-Nil-

SAFETY ACTION:

Action Taken:
Based on the findings of this accident plus those of two similar occurrences in the U.S.A., the Federal Aviation Administration (FAA) has issued a Notice of Proposed Rule-Making (NPRM) indicating an intent to adopt a new Airworthiness Directive (AD) that would require inspection of the front and rear wing spars for compression failures on the Champion (Bellanca) Models 7 and 8 airplanes. The FAA estimates that this AD will appear in the Federal Register by late summer 1987. Transport Canada then plans to reissue this AD for compliance by all applicable Canadian registered aircraft.

✈ ✈ ✈ ✈ ✈

CESSNA 172 C-FLLK
LIMBOUR, QUEBEC
28 JANUARY 1984

REPORT NUMBER: 84-Q40004 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	22
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot and his two passengers were on a visual flight rules (VFR) flight from North Bay to Rockcliffe Airport in Ottawa. As the aircraft was descending towards the destination airport, the engine lost complete power. A forced landing was attempted on a snow-covered abandoned airfield. Shortly after touchdown, the left wheel dug into the snow, and the aircraft nosed over.

The investigation revealed that the engine lost power because of fuel exhaustion. The pilot had departed Rockcliffe the same day with full tanks for a flight to North Bay. The aircraft was not refuelled in North Bay before returning to Rockcliffe, and full rich mixture was used throughout the flight. Computations, based on the aircraft performance at the power settings used, established that there was insufficient fuel on board to reach destination.

With the mixture set correctly, there would have been sufficient fuel to reach destination, but the aircraft would not have arrived with the required VFR fuel reserves.

The pilot reported he did not refuel in North Bay because he could not find 80-octane fuel; however, the tanks could have been safely topped up with 100-octane fuel, which was readily available. The pilot did not realize that 100-octane fuel was usable in his aircraft, and he did not follow standard operating procedures in his use of the mixture control.

FINDINGS:

Cause Related:
1. Given that he did not lean the fuel mixture in cruise flight, the pilot departed with insufficient fuel to complete the flight.

2. The engine lost power due to fuel exhaustion, and, during the subsequent forced landing onto an unprepared surface, the aircraft nosed over.

Other:
1. The pilot departed with insufficient fuel to complete the flight with the required VFR fuel reserves.

2. The pilot was not aware that 100-octane fuel could be used in his aircraft.

✈ ✈ ✈ ✈ ✈

PIPER PA-28R CHEROKEE C-GRTE
ALVENA, SASKATCHEWAN 1 mi S
01 MAY 1984

REPORT NUMBER: 84-C44015 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1330 CST
OPERATION: Private Company Business
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	107	71
LAST 90 DAYS	26	26

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot and three passengers were on a private company business flight from Saskatoon to Melfort Saskatchewan. The aircraft was cruising at 7,500 feet above sea level, when a sudden violent vibration began. The pilot closed the throttle, and the vibration diminished. He then carried out a forced landing on a paved highway, without further incident.

The investigation revealed that the tip of one of the propeller blades was missing. A small crack at the point of failure had been dressed out during a previous maintenance operation. A laboratory examination of the blade was carried out, and it was determined that the blade failed in a high-cycle mode of fatigue. The point of fatigue origin was coincident with the area dressed. The examination could not determine if the fatigue origin was from a pre-crack not removed during the dressing operation or from the dressing itself. The vibration was caused by the resultant imbalance of the propeller blades. The following laboratory report was completed: LP 180/84 - Propeller Blade, Piper PA-28R, C-GRTE.

FINDINGS:

Cause Related:
1. Failure of the propeller blade caused a severe inflight vibration.

2. The blade failed in a high-cycle mode of fatigue at a point of origin coincident with a previously dressed area.

Other:
-Nil-

* * * * *

BEECHCRAFT G-35 CF-COB
PRINCE ALBERT, SASKATCHEWAN
11 JUNE 1984

REPORT NUMBER: 84-C40032 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1147 CST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	60
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot, with one passenger on board, departed Saskatoon for Prince Albert, Saskatchewan. The flight was uneventful, and the aircraft landed on runway 25 at Prince Albert. While the aircraft was slowing down after touchdown, the gear retracted, and the aircraft came to rest on the runway, 1,500 feet from the threshold. The pilot reported that, during the roll-out, the passenger asked him a question about the operation of the landing gear. This distraction caused the pilot to inadvertently select the landing gear up instead of the flaps up.

FINDINGS:

Cause Related:
1. The pilot inadvertently selected the landing gear up after landing, when he was distracted by the passenger.

Other:
- Nil -

* * * * *

PIPER J5A C-FYZL
BELOEIL AIRPORT, QUEBEC
22 JUNE 1984

REPORT NUMBER: 84-Q40037 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,177	50
LAST 90 DAYS	150	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The instructor was checking out the pilot on a Piper J5A aircraft. They had completed three hours of circuits, when on landing, with the student at the controls, the aircraft bounced into the air. As the student was holding the control column back, the instructor took control and pushed it forward. The aircraft bounced again and then settled back onto the runway. The aircraft then veered to the right and came to rest in a ditch at the side of the runway.

The student misjudged the landing and allowed the aircraft to bounce. The student did not employ the correct bounce recovery technique and, by the time the instructor had taken control of the aircraft, he was unable to prevent the aircraft from hitting the runway again. The instructor subsequently lost directional control of the aircraft, and the aircraft went off the runway.

FINDINGS:

Cause Related:
1. The student misjudged the landing resulting in a bounced landing.

2. The student did not employ the correct bounce recovery technique.

3. The instructor did not take control of the aircraft in sufficient time to permit a safe recovery from the bounced landing.

Other:
-Nil-

* * * * *

CESSNA 185E C-FAUI
HOBBS LAKE, ONTARIO
24 JUNE 1984

REPORT NUMBER: 84-C44023 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1500 CDT
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	350	250
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot reported that, during take-off from Artery Lake, Ontario, the right float struck a submerged object. The pilot flew the aircraft approximately 12 miles to another remote lake, Hobbs Lake, and landed. On landing, the right float filled with water, and the aircraft rolled over and sank.

The weather was not a factor in this accident; the winds were from the northwest at five to ten knots. The pilot reported that he was unaware of the extent of the float damage when he continued the flight to Hobbs Lake.

The right float, which was extensively damaged during take-off, filled with water during the landing, causing the aircraft to overturn.

FINDINGS:

Cause Related:
1. During take off, the right float was damaged when it struck a submerged object.

2. The aircraft rolled over and sank, when the damaged float filled with water after landing.

Other:
-Nil-

* * * * *

CESSNA 150L CF-DLT
CHARLEVOIX, QUEBEC
20 JULY 1984

REPORT NUMBER: 84-Q40047 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1745 EST
OPERATION: Private Ferry
DAMAGE: Unknown
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,150	N/A
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MISSING	MINOR/ NONE
CREW	-	-	2	-
PASSENGERS	-	-	-	-

SUMMARY REPORT:

The two pilots took off from Charlevoix, Quebec, at about 1740 EST for a ferry flight to Riviere-du-Loup, Quebec. The flying time is about 20 minutes, and the aircraft had sufficient fuel for a flight of about one hour. The weather conditions were satisfactory for the visual flight rules (VFR) flight, but there were intermittent rain showers and scattered thunderstorms in the surrounding area. There were southwesterly surface winds at 15 to 20 knots, with gusts to 30 knots. After take-off, the aircraft was observed circling about the airport to gain altitude before adopting a northwesterly heading. About 20 minutes later, the aircraft was again seen west of the airport on a southeasterly heading. The aircraft did not arrive at its destination, and no distress message was received. An intensive search was initiated the following day, and the wallet of one of the pilots was found on a bank of the Saint Lawrence River two days later, in the area where the aircraft was seen for the last time. The wallet was the only item recovered.

Neither the aircraft nor its occupants have yet been found. It is thought that the pilot was forced to ditch the aircraft for undetermined reasons.

FINDINGS:

Cause Related:
1. The aircraft and its occupants disappeared for undetermined reasons.

Other:
-Nil-

* * * * *

CESSNA 150M C-GFZH
FORT QU'APPELLE, SASKATCHEWAN
5 AUGUST 1984

REPORT NUMBER: 84-C40062 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1800 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	214	15
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot flew to Fort Qu'Appelle, where he picked up a passenger for the return flight to their home 50 miles away. Having determined that the entire field length would be required for departure, he taxied to the northeast end of the grass strip and initiated a short-field take-off, using 10 degrees of flap. Lift-off was achieved one-half to two-thirds of the way down the 2,300-foot strip. The aircraft climbed to about 20 feet above ground level (agl), at 60 knots indicated airspeed, then began to settle. Believing that the aircraft would not clear power lines ahead, the pilot discontinued the take-off. He closed the throttle and landed the aircraft but was unable to stop on the runway remaining. To avoid a ditch off the end of the strip, the pilot veered the aircraft to the left; it rolled through brush and then nosed over.

The unlicensed strip was located in a valley and was not well maintained; the surface was uneven and covered with fairly high vegetation. Power lines and buildings bordered either end. There were no reported pre-crash malfunctions or failures.

The weather was good for visual flight rules (VFR) flight; the temperature was 29 degrees Celsius, and the surface wind was calm. The surface wind at Regina was from the west at 12 knots, and a downdraft may have existed at Fort Qu'Appelle because of the surrounding valley. Reportedly, the aircraft buffeted lightly after lift-off.

For undetermined reasons, the aircraft failed to climb after take-off. The pilot may not have maintained the necessary airspeed to compensate for the high air temperature and aircraft's increased weight with the passenger and cargo on board. The aircraft may have encountered a minor downdraft after lift-off, as indicated by the light buffet, or the pilot may have reduced the aircraft's airspeed below the required climb airspeed by increasing the aircraft's climb angle to avoid the obstructions ahead. Any of these situations would have caused the aircraft to settle.

FINDINGS:

Cause Related:
1. For undetermined reasons, the aircraft failed to climb after take-off.

2. Because the aircraft began to settle after becoming airborne, the pilot rejected the take-off but was unable to stop the aircraft on the remaining runway, and the aircraft nosed over in the brush.

Other:
- Nil -

* * * * *

CESSNA 172K N 46539
COTTAM, ONTARIO
26 AUGUST 1984

REPORT NUMBER: 84-O44910 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1800 EDT
OPERATION: Private Recreational
DAMAGE: None
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Not Available	Not Available
LAST 90 DAYS	Not Available	Not Available

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot was on a flight from Put-In-Bay, Ohio to Pontiac, Michigan. While the aircraft was en route and in the area of Cottam, Ontario, the engine lost oil pressure and then seized. The pilot carried out a forced landing.

The investigation revealed that the loss of oil pressure was due to the loss of engine oil. The oil sump quick drain plug had come out, allowing the oil to drain from the sump. The drain plug was improperly torqued, probably during installation. The engine had operated 38 hours since major overhaul.

FINDINGS:

Cause Related:
1. The engine seized due to oil starvation.

2. The oil starvation was due to the loss of engine oil through the sump drain, as a result of an improperly installed drain plug.

Other:
-Nil-

* * * * *

PIPER PA-28-140 C-GUJP
JONQUIERE AIRPORT, QUEBEC
26 AUGUST 1984

REPORT NUMBER: 84-Q40062 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	275	125
LAST 90 DAYS	69	44

INJURIES	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The pilot was conducting the flight in order to demonstrate the effect of a recently installed short take-off and landing (STOL) kit. The first attempt at landing led to an overshoot on short final, because there was an aircraft on the runway. After overshooting, the pilot placed the aircraft in a steep left climbing turn to reposition for landing. During the turn, the aircraft began descending. The pilot applied full up elevator but he was unable to stop the descent, and the aircraft struck the ground in a nose-low, steep, left-bank turn. Both occupants were seriously injured.

The pilot did not level the wings in his attempt to stop the descent. At extreme bank angles, applying up elevator serves only to tighten the turn. The only effective way to increase the pitch attitude of the aircraft during a manoeuvre of this type is to reduce the bank angle and then apply up elevator controls.

The manoeuvre chosen to reposition the aircraft for landing following the overshoot was not a normal manoeuvre; it involved extreme attitudes and accelerations which were not appropriate given the experience level of the low-time private pilot.

FINDINGS:

Cause Related:
1. The pilot attempted to carry out a flight manoeuvre which was beyond his experience level and ability, and he lost control of the aircraft.

2. The pilot did not employ the correct procedure to recover from the steep descending turn.

Other:
-Nil-

* * *

SUD AVIATION GY-80-160 C-FSVI
ST. ANDREWS AIRPORT, MANITOBA
27 SEPTEMBER 1984

REPORT NUMBER: 84-C44026 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1320 CDT
OPERATION: Private Training
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,578	25
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The instructor was carrying out a circuit check on the student pilot prior to the student's second solo flight. The student, who was flying the aircraft, performed a before-landing check but did not lower the landing gear. The aircraft touched down with the landing gear in the retracted position, and the propeller and engine cowling were damaged when they contacted the paved runway surface.

The landing gear and flaps are interconnected on this aircraft and are raised or lowered together using a rotary crank. The landing gear position is confirmed by visually checking the flap position and a cockpit light which illuminates when the landing gear is down and locked. The aircraft is not equipped with an aural device to warn pilots that the landing gear is not down and locked prior to landing. When the landing gear is fully retracted, the wheels protrude below the aircraft.

The instructor stated that he saw the student rotate the rotary crank during the before-landing check; however, the landing gear and flap positions were not confirmed. Apparently, the student rotated the crank in the wrong direction, thus raising the landing gear and flaps.

FINDINGS:

Cause Related:
1. The student pilot did not complete the before-landing check, and, as a result, the aircraft landed wheels up.

2. The instructor failed to adequately monitor the performance of the student pilot.

Other:
- Nil -

* * *

CESSNA 172H C-FVDE
SAINT-CROIX, QUEBEC
30 SEPTEMBER 1984

REPORT NUMBER: 84-Q40078 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	100
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The approach and landing were made in a light tail wind, and the aircraft bounced on touchdown. When it touched down again, the nose gear collapsed, and the aircraft bounced again. After touching down for the third time, the aircraft came to rest tail-up in the centre of the runway.

The tail wind increased the ground speed during the landing, thus increasing the aircraft's tendency to bounce. The pilot allowed the nose to drop after the initial bounce, thus causing a hard landing on the nosewheel.

FINDINGS:

Cause Related:

1. The tail-wind component increased the likelihood of bouncing when the aircraft landed.

2. After the initial bounce, the pilot allowed the aircraft nose to drop, causing the hard landing on the nosewheel.

3. The nose gear collapsed on landing under the force of the impact.

Other:
-Nil-

* * * * *

CHAMPION CITABRIA 7GCBC N96395
PIPE LAKE, ONTARIO
26 OCTOBER 1984

REPORT NUMBER: 84-C40913 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: Unknown
OPERATION: Private Ferry
DAMAGE: Destroyed
PILOT LICENCE: Commercial (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	689	46
LAST 90 DAYS	170	24

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had been engaged to fly a recently purchased aircraft from Mohall, North Dakota, to Corinna, Maine, the residence of the new owner. He entered Canada at Fort Frances, Ontario. From there he filed a visual flight rules (VFR) flight plan to Wawa, Ontario, via Thunder Bay, Terrace Bay and Marathon, with a one-hour stopover in Thunder Bay for fuel. He arrived at Thunder Bay at 1615 eastern standard time (EST) and took off at 1743 EST, but never arrived at Wawa. A search was conducted, and the aircraft was discovered 5 November 1984 near the summit of a heavily wooded hill; the pilot's body was found three days later, two miles south of the crash site. The aircraft had caught fire on impact with the ground, and only parts of the wings, which were torn off the aircraft by the trees, and heavier metal structures remained. The pilot suffered only minor injuries in the crash, and his death was due to exposure.

The aircraft was equipped with a very high frequency omnidirectional range (VOR) receiver as the only navigation aid, and the aircraft had no radio transmit capability. Very high frequency (VHF) communications could be received on the VOR receiver if detuned from the navigation mode or if the ground station could transmit through the VOR. On the selected route, only Thunder Bay had this capability.

At low altitude, the range of VOR or VHF signals would be limited. The aircraft was not equipped for flight in instrument conditions.

The emergency locator transmitter (ELT) installed in the aircraft was destroyed in the fire.

Although the pilot carried warm clothing on this flight, everything, except the light clothing he was wearing, was lost in the fire. As well, he lost his eyeglasses and his eyesight without correction was very poor. There was no evidence that the pilot constructed shelter or lit a fire, which may have been due to his degraded vision or lack of adequate survival training. A workable lighter was found on the body. An operable ELT may have allowed earlier discovery of the crash site and pilot. Planning for this flight was inadequate as illustrated below:

(a) The pilot failed to pre-arrange entry into the positive control zone at Thunder Bay with a receiver-only-equipped aircraft, for which he received a violation.

(b) Although the flight from Thunder Bay to Wawa was in darkness, the pilot did not request runway lighting at Wawa. One-hour notice was required.

(c) The pilot received a weather briefing at Fort Frances by telephone from the flight service station (FSS) at Kenora. Usable information received by the pilot was that ceilings north and south of Lake Superior would be 1,000 to 2,000 feet above ground level (agl) with winds from the south. The pilot did not ask for, nor did he receive en route or destination weather.

(d) During the ground time at Thunder Bay, the pilot did not check the weather for the flight to Wawa. (Weather at Wawa was below VFR limits. The forecast was for ceilings as low as 200 to 600 feet agl and visibility one-half to two miles in light drizzle and fog along the route.)

(e) The pilot took off from Thunder Bay at dusk. Operations at night in a positive control zone require two-way radio capability, therefore becoming airborne before dark was a consideration.

(f) The flight was conducted during darkness with overcast skies, over a relatively uninhabited area in an aircraft with inadequate, although not illegal, navigation aids. The aircraft first contacted the tops of trees in a level attitude, 1,150 feet above sea level, at cruising speed, indicating that the aircraft was not out of control. Because of the darkness of the night and the probability of cloud covering the hills, it is likely that the pilot inadvertently flew into high ground obscured by cloud. The investigation did not reveal any pre-crash aircraft malfunction or failure.

FINDINGS:

Cause Related:

1. The pilot took off from Thunder Bay without an appreciation of the poor weather conditions existing and forecast en route and at destination.

2. The aircraft flew into high ground in level flight at cruising speed.

3. The ELT was destroyed in the fire.

Other:

1. General planning and preparation for the flight was inadequate.

2. The pilot received a violation for operating in the Thunder Bay control zone without a two-way radio.

3. The pilot died of exposure and not from injuries received in the crash.

* * * * *

CESSNA 140 C-FDWO
ST-BENOIT-LABRE, QUEBEC
27 OCTOBER 1984

REPORT NUMBER: 84-Q40088 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1630 EDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	30
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The pilot and his passenger were departing St-Benoit-Labre, Quebec for the last leg of a cross-country flight. A normal engine run-up was completed, and the aircraft appeared to accelerate normally on take-off; however, just after the aircraft lifted off, the engine lost power momentarily. At approximately 100 feet above ground level (agl), the pilot initiated a steep 180-degree left turn in order to land. The engine again lost power momentarily, and the pilot applied carburettor heat.Moments later, while the aircraft was still in the steep left turn at about 50 feet agl, the engine stopped, and, according to the pilot, the aircraft stalled. Witnesses saw the aircraft descend steeply to the ground. The passenger, who was not wearing his seat-belt, was thrown out of the aircraft at impact. A carbon dioxide fire extinguisher was used to protect the pilot during the rescue from the burning wreckage. The pilot and passenger were seriously injured. At the time of the accident, the reported air temperature was 10 degrees Celsius, and the reported dew point temperature was 9 degrees Celsius. According to the Aeronautical Information Publication (AIP) Canada, serious carburettor icing can be expected at any power setting under these conditions. As well, the AIP notes that, after the application of carburettor heat, some delay can be experienced before normal engine power is restored and that, during this time, the engine may run rough as the ice melts or loosens and is ingested by the engine. Momentary power losses resulted from carburettor icing, and the engine stopped because of ice ingestion, following the application of carburettor heat. When the engine stopped, the pilot did not roll the wings level, and, as he was at 50 feet agl, he could not descend to maintain airspeed. Therefore, the aircraft stalled in the turn as the airspeed decreased, and the pilot could not effect a recovery because of the low altitude.

FINDINGS:

Cause Related:

1. The aircraft stalled while in a steep turn at low altitude after the engine stopped; the pilot could not effect a recovery because of the low altitude.

2. The engine power losses were caused by carburettor icing.

Other:

-Nil-

* * * * *

CESSNA 310C C-FFL0
QUEBEC AIRPORT, QUEBEC
03 NOVEMBER 1984

REPORT NUMBER: 84-Q40091 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1500 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	347	178
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

During an approach to land at Quebec Airport, the pilot, when requested by the tower controller, indicated to the controller that the landing gear was down and locked. As the aircraft rounded out, the propeller blades struck the runway, and the pilot realized that the landing gear was not down. He closed the throttles, and the aircraft settled onto the runway.

The investigation did not reveal any malfunction with the landing gear system. As the pilot was making a power approach, the landing horn did not sound until the throttles were retarded, after the propeller blades had struck the runway. The landing gear lever was found in the neutral position. The pilot did not check the landing gear warning lights, nor did he use the side mirrors to verify the landing gear position. A pilot, waiting for take-off, observed the landing gear in the retracted position but was unable to alert the pilot of the landing aircraft in time. The investigation revealed that the pilot had inadvertently selected the landing gear lever from the up to the neutral position rather than to the down position. He did not perform the pre-landing check adequately, nor did he recheck the landing gear position when requested by the tower.

FINDINGS:

Cause Related:

1. The pilot placed the landing gear selector in the neutral position instead of the down position and, as a result, landed wheels up.

2. The pilot did not check the position of the landing gear with either the landing gear warning lights or the side mirrors.

Other:
-Nil-

* * * * *

PIPER PA-28R-180 C-GPEJ
WATSON LAKE, YUKON 33 mi W
19 NOVEMBER 1984

REPORT NUMBER: 84-W40075 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 PST
OPERATION: Private Ferry
DAMAGE: Substantial
PILOT LICENCE: Senior Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	100
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft departed Fort St. John, British Columbia at 0904 with a full load of fuel on a day visual flight rules (VFR) flight to Watson Lake, Yukon. As the flight progressed westward, the pilot encountered deteriorating weather, and at 1117, she air filed an instrument flight rules (IFR) flight plan to Watson Lake, with Fort Nelson, British Columbia as an alternate airport. At this time, the destination weather was 1,300 feet overcast with the visibility seven miles. The aircraft was just west of Fort Nelson. On arrival at Watson Lake, the pilot attempted two successive approaches but failed to sight the runway on either approach. On the missed approach at 1310, she advised the Watson Lake Flight Service Station (FSS) that there was insufficient fuel remaining to fly to Fort Nelson and requested the location of the nearest VFR Airport. The Watson Lake FSS advised her that the nearest VFR airport was Teslin, Yukon, about 116 miles further to the West.

Prior to the departure from Fort St. John, the pilot received a weather briefing for the planned route. During the flight, the pilot requested and received two weather updates for Watson Lake. At the time of arrival at Watson Lake, the weather services were reporting a balloon ceiling 500 feet scattered, 1,100 feet overcast, 7 miles visibility, and lower cloud within 1.5 miles radius of the airport.

Approximately 20 minutes later when the aircraft was en route to Teslin and in cloud, the engine sputtered as the selected fuel tank went dry. The pilot switched tanks; however, a few minutes later, the engine stopped and could not be restarted. The pilot trimmed the aircraft for its best glide, and, at that time, the aircraft descended out of cloud into visual conditions. The pilot attempted to glide the aircraft to a snow-covered lake but was unsuccessful, and the aircraft was force-landed in tall trees just short of the lake.

At the time of the accident, the aircraft had been airborne for 4 hours and 26 minutes. A full fuel load equates to approximately five hours flying time; however, this figure is accurate for conditions of best cruise only and does not take into account start, taxi, approaches, or other variations. When the pilot air filed at 2 hours and 13 minutes into the flight, there was insufficient fuel on board the aircraft to conduct the flight using Fort Nelson as an alternate. The pilot, rather than diverting to Fort Nelson to refuel, proceeded to Watson Lake.

FINDINGS:

Cause Related:

1. The pilot filed a flight plan under instrument flight rules and flew the flight-planned route with insufficient fuel to complete the flight with the required fuel reserves.

2. The engine stopped as a result of fuel exhaustion.

Other:

-Nil-

✈ ✈ ✈ ✈ ✈

PIPER PA-28-140 CHEROKEE C-FCHV
SELKIRK, ONTARIO
3 FEBRUARY 1985

REPORT NUMBER: 85-O50003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1435 EST
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	150	108
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	1	-

SUMMARY REPORT:

The single-engine aircraft attempted to take off for a local flight from a snow-covered runway. About midway along the 2,500-foot runway, the aircraft veered to the right and continued its roll into an adjacent field. Lift-off occurred 1,200 feet off the side of the runway, and the aircraft climbed out towards a stand of trees. After striking the trees, the aircraft hit the ground, came to rest in an inverted attitude, and burst into flames. The pilot kicked out the windscreen in front of him and escaped. He then returned and rescued the passenger.

The investigation established that the aircraft attempted to take off from a runway covered with three inches of snow and with a quartering 10-knot tail wind. The pilot had selected a flap setting of 25 degrees for take-off. After the aircraft ran off the side of the runway and became airborne, it climbed out in a high nose-up attitude and at a low speed. The aircraft stalled and struck the trees. During the evacuation, the passenger had difficulty releasing the seat-belt and sustained severe burns to his face and hands.

The aircraft's take-off roll was extended by the tail wind component and the amount of snow on the ground. As the pilot did not compensate for the crosswind component, directional control was lost and the aircraft ran off the runway towards a stand of trees. The take-off was continued and, once airborne, the trees could not be cleared because of the short distance remaining.Also, the aircraft's climb angle was reduced because of the high nose-up attitude, the low speed, the 25 degrees of flaps and the tail wind component. The aircraft then stalled and struck the trees before coming to rest on the ground. The pilot expected the passenger to follow him while he was evacuating the burning aircraft, but the passenger, an elderly man with arthritic hands, was unfamiliar with the seat-belt mechanism.

FINDINGS:

Cause Related:

1. The pilot attempted a take-off with a quartering tail wind on a snow-covered runway.

2. When the pilot lost directional control, the aircraft departed the runway, and the pilot continued the take-off attempt towards a line of trees.

3. The pilot's use of 25 degrees of flaps and a high nose-up attitude prevented the aircraft from clearing the trees in the existing conditions.

4. During the pilot's attempt to clear the trees, the aircraft stalled and crashed.

5. The passenger was not familiar with the seat-belt mechanism and had difficulty releasing it.

Other:
-Nil-

* * *

CESSNA 185A C-FLYO
108 MILE RANCH, BRITISH COLUMBIA
16 FEBRUARY 1985

REPORT NUMBER: 85-P50005 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1730 PST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	205	200
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot made a low-power descent and was crossing the runway at midfield to join right downwind, when the engine (Continental IO-360A) stopped. The pilot force-landed in a field covered with three feet of snow, and the aircraft nosed over.

During the forced landing, the pilot enriched the mixture and applied full throttle in an attempt to restart the engine.He also turned the ignition to the start position, but he did not operate the electric fuel pump. The pilot landed in the field because he was unable to manoeuvre the aircraft into a position from which a safe landing could be made on the runway.

Inspection of the engine and fuel system failed to reveal the cause of the loss of engine power. Use of the electric fuel pump may have helped to restart the engine. The aircraft nosed over because it was landed in deep snow.

FINDINGS:

Cause Related:
1. The engine stopped for undetermined reasons.

2. The aircraft nosed over because it was force-landed in deep snow.

Other:
1. The pilot did not use the electric fuel pump during his attempt to restart the engine.

* * *

CESSNA 150D CF-PRS
BALDWIN AIRPORT, ONTARIO
3 MARCH 1985

REPORT NUMBER: 85-O50011 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1640 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	200
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

Shortly after take-off, at an altitude of approximately 150 feet above ground level, the engine lost power. The pilot decided to carry out a forced landing in a clearing outside the boundary of the airport. Following touchdown, the aircraft bounced, and, on the second touchdown, the nosewheel struck a mound of dirt and collapsed. The aircraft nosed over, damaging the propeller, the spinner, and the nose cowling.

The aircraft had been parked outside for over three winter months with the fuel tanks half full. During the pre-flight inspection, the pilot did not find any contaminants in the fuel taken from the wing tanks; however, no fuel sample was collected from the gascolator drain. Following the accident, an inspection of the engine did not reveal any fuel system abnormalities except for ice crystals and foreign particles found in the fuel filter of the gascolator bowl. It was also found that Service Bulletin A1-84, which recommended that the cellular floats be replaced with metal ones, had not been complied with. There was no evidence of any irregularity of the float mechanism.

Because the aircraft had been parked outdoors over the winter months with partially filled fuel tanks, ice crystals formed in the tanks. The ice crystals and foreign particles restricted the flow of fuel in the gasculator bowl and, as a result, the engine lost power. Due to the nature of the landing area, it was difficult to avoid and manoeuvre around the obstacles.

FINDINGS:

Cause Related:

1. Because the aircraft had been parked outdoors for over three winter months with partially filled fuel tanks, ice crystals formed in the fuel system.

2. Ice crystals and foreign particles restricted the flow of fuel, and, as a result, the engine lost power.

3. The nature of the landing area made it difficult to avoid or manoeuvre around the obstacles.

Other:

1. Service Bulletin A1-84 had not been complied with.

* * * * *

CESSNA 177 CARDINAL C-GOXO
ANGLEMONT AERODROME, BRITISH COLUMBIA
05 APRIL 1985

REPORT NUMBER: 85-P50008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1500 PST
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	70	60
LAST 90 DAYS	70	60

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During the unsupervised student pilot's attempt to land the aircraft at a mountain strip, the aircraft bounced twice. On the second bounce, the aircraft's left wing and nose dropped, and the aircraft struck the ground in a left-wing, nose-low attitude.

The pilot could not remember the landing; however, he did recall using normal approach speeds and configurations up to the point of touchdown. An experienced pilot who witnessed the accident stated that engine power was not applied when the aircraft bounced and that the aircraft appeared to stall as its wing and nose dropped. The runway slopes steeply upward, and there is a mountain beyond which precludes an aircraft from overshooting.

The investigation determined that the pilot did not alter his landing flare to compensate for the steeply sloping runway, and, as a result, the aircraft landed hard and bounced. It is also likely that the pilot was aware that an overshoot was not possible and he wanted to complete the landing.Consequently, he did not apply engine power, which would have been the correct recovery technique for a bounced landing.As a result, the aircraft stalled and crashed.

The pilot had a student permit and, at the time of the accident, was not under the supervision and direction of an instructor. The student pilot had never landed at this airport, which, considering the size of the strip, the steep upslope and the surrounding terrain, exceeded his experience level and capabilities.

FINDINGS:

Cause Related:

1. The strip was not suitable for the inexperienced student pilot.

2. The unsupervised student pilot did not alter his landing flare to compensate for the steeply sloping runway, and, as a result, the aircraft landed hard and bounced.

3. The correct recovery technique for a bounced landing was not used, causing the aircraft to stall and crash.

Other:

1. The student pilot was not under the supervision and direction of an instructor when he made the flight.

* * * * *

CESSNA 180 C-GHCP
SYDNEY ISLAND, BRITISH COLUMBIA
09 APRIL 1985

REPORT NUMBER: 85-P50009 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1630 PST
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	915	3
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot landed the aircraft on a narrow, sandy, sloping beach. During the landing roll, the aircraft drifted left; the left wheel entered the water, and the aircraft nosed over.

The weather was not a factor in this accident, and the investigation did not reveal any pre-accident aircraft malfunctions or failures. The aircraft did not have a valid Certificate of Airworthiness, and the propeller was time expired.

The pilot reported that he landed the aircraft on the beach so he could close a cowl door that had opened in flight. He also stated that he wanted to experience the challenge of landing on the beach. On landing, the pilot used brake and rudder to maintain directional control, but he was unable to prevent the aircraft from turning downslope and entering the water. Drag on the wheels from the water and the application of brakes caused the aircraft to nose over.

FINDINGS:

Cause Related:
1. The pilot landed in an unsuitable area and was unable to maintain directional control of the aircraft.

Other:
1. The aircraft did not have a valid Certificate of Airworthiness.

2. The propeller was time expired.

* * * * *

ENGINEERING AND RESEARCH CORP
ERCOUPE 415C CF-TER
BRIGDEN, ONTARIO 3 mi SW
14 APRIL 1985

REPORT NUMBER: 85-O50026(Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1200 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	75	5
LAST 90 DAYS	20	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was cruising at about 1,400 feet above ground level, when the engine lost power. The pilot force-landed the aircraft on a relatively smooth field and rolled into a ploughed area. The nose gear collapsed, and the aircraft nosed over.

There were buildings about 65 feet high at the approach end of the selected field, and there was a 12-knot tail wind on final. A fitting in the main fuel line, between the fuel filter and the carburettor, had failed as a result of a fatigue-induced pre-crack.Ercoupe had issued at least two Service Bulletins, Numbers 12 and 24, in 1946, recommending that the fitting be changed; however, this aircraft had never been modified. The broken fitting resulted in a loss of engine power because of fuel starvation.

The approach was influenced by the buildings and tail wind, such that, the aircraft touched down over three-quarters of the distance down the smooth field, and there was insufficient distance in which to stop before entering the ploughed area. The rough ground caused the nose gear to fail in overload.

FINDINGS:

Cause Related:
1. The main fuel-line fitting failed as the result of a fatigue-induced pre-crack, resulting in loss of engine power because of fuel starvation.

2. The aircraft had not been modified as recommended in the Ercoupe Service Bulletins.

3. The nose gear failed in overload.

Other:
-Nil-

* * * * *

CHAMPION 7EC C-FATF
CLANDEBOYE, MANITOBA
07 MAY 1985

REPORT NUMBER: 85-C50022 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1205 CDT
OPERATION: Private Ferry
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	3
LAST 90 DAYS	3	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The take-off was attempted from a narrow grass area, close and parallel to a road and power line. The take-off run was to the north, in a light and occasionally gusty wind from the northwest. Immediately after lift-off, the aircraft drifted to the right across the road, struck a power pole and crashed to the ground. The pilot reported that the aircraft drifted right"despite full rudder deflection."

The wind was not strong, and the pilot should have been able to maintain directional control of the aircraft with proper control inputs.

FINDINGS:

Cause Related:
1. The pilot did not maintain directional control after take-off, and the aircraft struck a pole.

Other:
-Nil-

* * * * *

CESSNA 170B C-FHRL
MOOSOMIN, SASKATCHEWAN 5 mi SE
07 MAY 1985

REPORT NUMBER: 85-C50020 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0625 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	103	56
LAST 90 DAYS	7	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was heard to take-off at about 0600 from the pilot's home farm strip. About 15 minutes later, occupants of a neighbouring farm were awakened by the sound of an aircraft as it flew low over their house. The aircraft was observed to fly through the yard at very low level and strike a stand of trees. The aircraft struck the trees while climbing, rolled to the left, and crashed to the ground in an inverted attitude. The first tree strike was 16 feet above ground level. The pilot was fatally injured.

The investigation did not reveal any pre-accident aircraft malfunctions, and the weather was not a factor.

The witnesses to the accident were good friends of the pilot, and, reportedly, the pilot had quite often flown at very low level through their yard.

The pilot flew the aircraft at a low height above ground level and failed to avoid a stand of trees in his flight path. The aircraft became uncontrollable after impact with the trees.

FINDINGS:

Cause Related:
1. The pilot failed to avoid a stand of trees while flying at a very low altitude.

Other:
-Nil-

* * * * *

BEECH BONANZA V35B C-GQWG
SASKATOON AIRPORT, SASKATCHEWAN
08 MAY 1985

REPORT NUMBER: 85-C50023 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1838 CST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	180	33
LAST 90 DAYS	14	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot reported on the downwind leg for runway 32 and was asked to keep the base leg "in close" for traffic separation. He lowered the landing gear and extended 15 degrees of flap. The aircraft was flared at about 90 knots indicated airspeed and, on touchdown, landed hard and bounced. When the aircraft touched down again, the nose gear separated, and the propeller, nose gear doors, and lower nose cowling contacted the runway.

The pilot had incorrectly flared the aircraft, and it bounced. When the aircraft touched down again, the nose gear separated. Laboratory analysis revealed that the nose gear fork failed as a result of overload with no evidence of pre-cracking.

The following laboratory report was completed:
LP 151/85 - Nose Gear Fork.

FINDINGS:

Cause Related:

1. An improper landing flare resulted in a hard landing.

2. The nose gear fork failed in overload, and, subsequently, the nose gear separated.

Other:
-Nil-

* * * * *

MAULE M5-235-C N9101E
KLUANE LAKE, YUKON
10 MAY 1985

REPORT NUMBER: 85-W50902 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1755 YDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,000	250
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	1	-

SUMMARY REPORT:

The aircraft was on a visual flight rules flight plan from Northway, Alaska to Whitehorse, Yukon. Approximately 45 minutes after take-off, the pilot encountered low ceilings and reduced visibility in heavy snow showers. The pilot began a left turn at low altitude over a lake and away from the high terrain to the right in an attempt to get back into the clear. During the turn, the pilot lost all visual reference with the ground; the aircraft descended in the turn and struck the ice.

The pilot had received a weather briefing in Northway and had been advised that, although the weather at both Northway and Whitehorse was above that required for visual flight, the weather midway was unsuitable, with visibilities reduced to less than one mile in heavy snow showers. The weather briefer recommended to the pilot that a visual flight not be attempted because of the en route weather conditions. After the accident, the pilot confirmed that the weather near the accident site was essentially as had been described by the weather briefer.

Although the aircraft was equipped with the required instrumentation and equipment for flight under instrument meteorological conditions, the pilot had very limited instrument flying experience and his licence was not endorsed for instrument flight.

The pilot disregarded the information and advice given by the weather briefer and continued with the flight into weather conditions which were forecast to be below that required for visual flight. When the forecast conditions were encountered en route, the high terrain to the right forced the pilot to turn back over the lake, where he lost visual reference with the ground.

FINDINGS:

Cause Related:

1. The pilot conducted a flight under visual flight rules into known unsuitable en route weather conditions.

2. During the turn at low altitude to remain visual, the pilot lost visual reference with the ground and inadvertently allowed the aircraft to descend until it struck the ground.

Other:

-Nil-

* * * * *

PIPER PA 18 CF-FUQ
BURNT ROSE LAKE, BRITISH COLUMBIA
13 MAY 1985

REPORT NUMBER: 85-W50017 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1130PDT
OPERATION: Private Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	500
LAST 90 DAYS	40	40

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was on a flight from his lodge at Turnagain River, British Columbia to Watson Lake, Yukon to pick up supplies. En route, power was reduced to descend to a lower altitude. When the pilot attempted to add engine power, he was unable to move the throttle lever. The pilot forced the lever in an attempt to free it. The lever became "sloppy" and could be moved without normal resistance. However, the engine did not respond. Without sufficient power to maintain level flight, the pilot force-landed the aircraft into tall trees, and the aircraft was substantially damaged.

The aircraft had undergone repairs prior to the occurrence which included a reinstallation of the engine (Lycoming 0-320-A2B). After that installation, the throttle had jammed once, resulting in a forced landing. The throttle was rigged, and, on the next flight, the pilot noted that the throttle was not moving freely. At least two other flights were flown during which time the binding was evident in the throttle.

After the accident, when the throttle linkage was disconnected from the carburettor, the throttle lever was operated without evidence of binding or stretching. The carburettor was removed and forwarded to the Engineering Facility for examination. The leather on the accelerating pump plunger was found to be folded back in the pump chamber. This caused the throttle to jam. It is possible that the leather was damaged during the last installation of the engine.

The following laboratory report was completed:
LP 154/85- Carburettor Operating Mechanism.

FINDINGS:

Cause Related:

1. The throttle jammed on an earlier flight and was binding on at least two other flights; the pilot continued to fly the aircraft with a known throttle defect.

2. The leather on the acceleration pump plunger folded over in the pump chamber, causing the throttle to jam at a low power setting.

3. The pilot was unable to maintain flight at the low power setting and force-landed the aircraft into tall trees.

Other:

-Nil-

* * * * *

PIPER PA-28-140 C-GCKI
ASHERN, MANITOBA 4 mi SE
13 MAY 1985

REPORT NUMBER: 85-C50025 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1830 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	450	300
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The flight from St. Andrews to Ashern was uneventful, and a normal landing was completed at a private grass strip, where a passenger deplaned. The pilot, with two remaining passengers, commenced take-off for the return flight. As the aircraft approached take-off speed, the left main wheel struck a partially obscured boulder. The take-off was rejected, and the aircraft came to rest at the edge of the strip. Damage occurred to the left gear and the left wing tip.

Because of the dead grass on the edge of the strip, the boulder was partially concealed, and the pilot did not notice it during the take-off run.

FINDINGS:

Cause Related:
1. The left main wheel struck the partially concealed boulder during the take-off run.

Other:

- Nil -

* * * * *

CESSNA 185A N4175Y
CRANBROOK AIRPORT, BRITISH COLUMBIA
16 MAY 1985

REPORT NUMBER: 85-P50902 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1621 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	260	9
LAST 90 DAYS	72	9

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During the take-off run, as the tail of the aircraft was becoming airborne, the aircraft's left wing lifted, and the aircraft veered to the left. The right wing tip and right horizontal stabilizer contacted the runway. The take-off was discontinued, and the aircraft came to a halt on the runway.

The pilot had limited experience on tail-wheel-type aircraft. As the winds were calm and did not adversely affect the take-off, it was concluded that inappropriate control inputs made by the pilot caused him to lose control on take-off.

FINDINGS:

Cause Related:
1. The pilot lost control on take-off because of his limited experience on tail-wheel-type aircraft.

Other:
-Nil-

* * * * *

PIPER PA-28-140 CHEROKEE C-GICB
LADYSMITH HARBOUR, BRITISH COLUMBIA
17 MAY 1985

REPORT NUMBER: 85-P50013 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1355 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	70
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot and three passengers departed Nanaimo, British Columbia on a visual flight to Abbotsford Airport. As the aircraft was climbing through 2,500 feet above sea level (asl), the passenger in the right front seat noted liquid forming on the windshield. The pilot immediately suspected an oil leak and initiated a turn to return to Nanaimo Airport. Power was reduced in an effort to forestall engine seizure.

During the descent, the engine (Lycoming D-320-EZA) stopped and the pilot elected to ditch the aircraft in Ladysmith Harbour. The pilot advised Nanaimo Radio of his intentions and briefed the passengers. The pilot picked a point near the shore for the ditching. Final descent was set up at 50 to 55 knots at 1,500 feet asl. The aircraft touched down in a nose-high attitude at an airspeed of 40 to 45 knots and remained afloat for five to six minutes.

The front-seat occupants received bruises and cuts when they were thrown forward against the instrument panel. Neither front-seat occupant was wearing the shoulder harnesses which were installed in the aircraft. The use of the shoulder harnesses would have minimized the occupants' injuries.

An examination of the engine oil system was carried out following recovery of the aircraft from Ladysmith Harbour. The engine was pressurized gradually to a maximum of 25 to 30 pounds per square inch (psi). At approximately 20 psi, a substantial amount of oil and water flowed out from around the front crankshaft seal. Staining around the crankshaft seal indicated that oil had been seeping out prior to the loss of engine power in flight. All other oil system components were serviceable. The engine had been in operation for 1,970 hours since overhaul. The cause of the crankshaft seal failure could not be determined.

The following laboratory report was completed:
LP 133/85 - Oil Cooler and Oil Lines.

FINDINGS:

Cause Related:
1. The engine front crankshaft seal failed for undetermined reasons, allowing the engine oil pressure to decrease to zero.

2. The engine seized because of a lack of lubrication.

Other:
1. The front-seat occupants were not wearing the available shoulder harnesses.

* * * * *

PIPER PA28 C-GNQC
MIDALE, SASKATCHEWAN 6 mi N
19 MAY 1985

REPORT NUMBER: 85-C50036 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1910 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,450	500
LAST 90 DAYS	70	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Approximately 20 minutes after take-off, the aircraft's engine (Lycoming 0-360-A4A) lost oil pressure. The pilot carried out a precautionary landing in a farm field, and, during the roll-out, the nosewheel struck a hole and collapsed.

Examination of the engine revealed that a tooth on the oil pump idler impeller was missing. Without the tooth, the idler will not mesh with the driving impeller, and the pump will not produce oil pressure. The cause of the tooth failure was not determined.

FINDINGS:

Cause Related:
1. The oil pump idler impeller failed, causing the loss of oil pressure.

2. The aircraft was substantially damaged during a precautionary landing.

Other:
- Nil -

* * * * *

PIPER PA-28-151 C-GXLG
BOWRON LAKE, BRITISH COLUMBIA
19 MAY 1985

REPORT NUMBER: 85-P50014 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	145	61
LAST 90 DAYS	33	31

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	3	-

SUMMARY REPORT:

The pilot and three passengers landed at Bowron Lake and, about one hour later, took off from runway 24 for the return flight to Prince George, British Columbia. The pilot performed a short-field, obstacle clearance take-off with 25 degrees of flap selected. The aircraft was airborne one-half to three-quarters down the 3000-foot runway, and a climb angle was established to maintain 70 mph. Over the trees at the end of the runway, the aircraft gradually pitched up until the stall warning sounded. The pilot eased the nose down; however, before flying speed could be regained, the aircraft struck some trees and pancaked into a creek. The aircraft came to rest partly submerged in the water. The four occupants were seriously injured.

The investigation revealed no pre-crash aircraft malfunction or failure. There were scattered clouds, light westerly winds, and the temperature was 24 degrees Celsius.

The calculated aircraft weight was 2,260 pounds with a maximum allowable weight of 2,325 pounds. The center of gravity (C of G) was calculated at 91.08 inches aft with a permissable range of 83 to 93 inches aft. Although no limits were exceeded, the aircraft was operating at near maximum weight with an aft C of G.

Passenger seating was rearranged at Bowron Lake, which resulted in the C of G being further aft than on the previous take-off.

Density altitude at take-off was calculated to be approximately 5,000 feet above sea level, which would give a calculated take-off ground run of about 2,500 feet. As the aircraft became airborne 1,500 to 2,250 feet down the runway, it became airborne at too low an airspeed and stalled.

Post-flight calculations indicated that the take-off from runway 06 was possible without resorting to short-field or obstacle clearance techniques, as there were no near obstacles on the departure path.

FINDINGS:

Cause Related:
1. The pilot elected to take off in a direction that required an obstacle clearance climb, when an alternate direction was available.

2. The aircraft became airborne at too low an airspeed and stalled.

3. There was insufficient altitude to allow a successful stall recovery.

Other:
-Nil-

* * *

RAM AIR CHARTER LTD.
CESSNA A185F C-GFDP
FORT McMURRAY AIRPORT, FORT McMURRAY, ALBERTA
23 MAY 1985

REPORT NUMBER: 85-W50020 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1850 MDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,650	1,200
LAST 90 DAYS	50	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was being ferried from Winnipeg, Manitoba, to Inuvik, Northwest Territories. The pilot had refuelled at Prince Albert, Saskatchewan and was landing at Fort McMurray to refuel again. On touchdown at Fort McMurray, he heard a loud bang and saw that the left main wheel had broken away from the aircraft. The aircraft ground looped, and the left main landing gear leg, the left wing, and the propeller were damaged.

The aircraft had been made available for sale with a company in Winnipeg, but after some dispute, the owner was taking the aircraft back. The Hobbs Meter indicated that the aircraft had been flown for about 10 hours while in the possession of the sales firm.

The left main wheel and hub were examined at the Canadian Aviation Safety Board's laboratory to determine why the wheel had broken away. The failure patterns indicated that the damage was likely sustained during a hard landing, a short time prior to the accident. Investigators were unable to establish when such a landing had occurred and therefore could not determine the cause of the failure.

FINDINGS:

Cause Related:
1. The aircraft was damaged when the left main wheel broke away on landing, causing the aircraft to ground loop.

2. The left main wheel broke away because of damage sustained during a previously unreported hard landing.

Other:
-Nil-

* * * * *

BRITTEN-NORMAN BN2A-8 C-GPCF
LAMMERS FIELD, YUKON
23 MAY 1985

REPORT NUMBER: 85-W50021 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2215 PDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,000	1,000
LAST 90 DAYS	175	175

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was making his fourth landing of the day at a gravel strip. He carried out a low continuous turn from downwind and rolled out on final just prior to touchdown. On touchdown, the aircraft veered to the left. The pilot was unable to maintain directional control, and the aircraft went off the side of the runway. The landing gear collapsed, and the aircraft struck a large empty fuel tank and came to a stop.

The airstrip is oriented east-west beside a river flowing through a narrow valley. The valley is flanked by mountains on both sides and to the west. An approach from the west requires a steep restricted entry, while an approach from the east is normal. The airstrip is normally 1,800 feet long; however, spring flooding of the adjacent river had reduced the available length to 1,300 feet and had displaced the threshold on the eastern end of the runway 200 feet to the west.

At the time of the accident, the setting sun was just above the ridge of hills at the west end of the airstrip.

Although the pilot had made three trips earlier in the day, the timing of the last trip meant that the sun was directly in his eyes on final approach and landing. Because of the short roll-out on final and the displaced threshold, the pilot was committed to land. He was reluctant to attempt an overshoot towards the hills to the west with the aircraft at close to maximum gross weight. In restricted visibility, the pilot landed at an angle to the runway center line and did not realize his error in time to take effective corrective action.

FINDINGS:

Cause Related:
1. The pilot elected to fly an approach and attempt a landing without due consideration of runway length, surrounding terrain, and the sun's position.

Other:
-Nil-

* * * * *

PIPER PA-32-300L C-GMCG
BUTTONVILLE, ONTARIO
25 MAY 1985

REPORT NUMBER: 85-050035 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0740 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,100	550
LAST 90 DAYS	10	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft took off from runway 33 and was at approximately 200 feet above the ground, when engine oil appeared on the windshield. The pilot in the right seat assumed control and began a steep left turn in an attempt to land on runway 15. He rolled out to the left of the runway edge and began a right turn to realign the aircraft with the runway. The right wing tip and the nose gear struck the taxiway, substantially damaging the aircraft.

Prior to departure, the pilot had unfastened the top engine cowling in order to add some oil. During the investigation, the oil dip stick filler cap was found unlocked, and there was evidence of oil leaking from around the dip stick seal.

The owner of the aircraft, who was in the left seat, was relatively inexperienced, and, when the oil appeared on the windshield, he gave control to the pilot in the right seat. The pilot flying from the right seat, in an attempt to realign the aircraft with the runway, stalled the aircraft. His ability to fly accurately was probably inhibited by the presence of oil on the windshield, which restricted forward visibility and by the fact that flight instruments were only located on the left instrument panel.

The attempt to land on runway 15 required a steep 180-degree turn at low altitude which would not have been necessary on other available runways.

FINDINGS:

Cause Related:
1. The oil dip stick filler cap was found unlocked, and there was evidence that oil had been leaking from the filler neck.

2. The aircraft stalled when effecting a 180-degree turn at low altitude, in an attempt to return to runway 15.

3. The lack of flight references made it difficult for the pilot in the right seat to maintain control of the aircraft.

Other:
-Nil-

* * *

MAULE M4-210C C-FVQG
LA RONGE, SASKATCHEWAN
25 MAY 1985

REPORT NUMBER: 85-C50029 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1950 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,983	7
LAST 90 DAYS	15	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

Shortly after power was applied for take-off, the aircraft began to swing to the left, and the pilot elected to reject the take-off. The aircraft continued to swing and left the runway. The main landing gear collapsed, and the aircraft came to rest heading 60 degrees off and to the left of the runway heading. The reported surface wind was 50 degrees from the left at six knots.

The pilot reported that he was not familiar with the throttle locking mechanism. He felt that, while attempting to close the throttle, he allowed the aircraft to swing further to the left and leave the runway.

FINDINGS:

Cause Related:
1. The pilot rejected the take-off after the aircraft began to swing to the left.

2. The pilot was not familiar with the throttle locking mechanism, and, while attempting to close the throttle, he lost control of the aircraft.

3. The main landing gear collapsed when the aircraft left the runway.

Other:
-Nil-

* * *

TAYLORCRAFT BC 12D C-FWFU
THEDFORD, ONTARIO 4 mi N
30 MAY 1985

REPORT NUMBER: 85-O50038 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	139	89
LAST 90 DAYS	4	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft departed Sarnia Airport on a 15-minute flight to a private airstrip near Thedford. As the pilot commenced his approach at destination, a gusty 20-knot wind was blowing across the 2,300-foot long runway. After touching down, the pilot rejected the landing, climbed out, and did a left-hand circuit for another approach. While the aircraft was turning final, it drifted to the right of the approach path. The pilot then initiated a steep banking turn to the left, during which the aircraft pitched up suddenly before spinning into trees. The pilot sustained fatal injuries.

The investigation established that the pilot lacked recent flying experience and that his medical validation certificate had been expired for two years. A few days before the accident, the pilot had discussed with an instructor the possibility of taking some dual recurrency training.

The pilot appeared to have rejected the first landing because he could not control the aircraft in the gusty cross-wind. On the second approach, the pilot attempted a 360-degree turn to the left to realign the aircraft with the runway because he realized that he had drifted too far to the right. While executing the turn to the left in the strong gusty wind, the aircraft stalled and spun. When the spin occurred, insufficient height remained for the pilot to recover before the aircraft struck the trees.

Although the pilot's medical validation certificate had been expired for two years, there was no evidence that incapacitation or physiological problems affected his performance.

FINDINGS:

Cause Related:

1. The pilot lacked recent flying experience and attempted a landing in a gusting cross-wind.

2. On the first landing attempt, the pilot was not able to control the aircraft sufficiently to complete the landing.

3. On the second approach, while making a steep banking turn to the left to align the aircraft with the runway, the aircraft stalled and entered a spin without sufficient height for recovery.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

CESSNA 210L C-GNEL
BALDWIN, ONTARIO
30 MAY 1985

REPORT NUMBER: 85-O50037 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1615 EDT
OPERATION: Private Ferry
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,377	1,000
LAST 90 DAYS	55	55

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The owner/pilot was ferrying his aircraft from Buttonville to Baldwin Aerodrome where he planned to operate for the summer. It had rained for several days prior to the ferry flight, and the planned flight was delayed to await clearing weather. After circling at destination, an approach was set up to the 2,500-foot-long grass strip. Touchdown was normal, and brake was applied after a few hundred feet of roll-out. The aircraft did not slow down, so full brake was applied; the braking action did not have any noticeable effect. The pilot could see water splashing up from the wheels. As the aircraft slowed, the nosewheel began to dig into the soft turf, and the aircraft nosed over.

This was the pilot's first landing of the spring at this airstrip, and he did not inspect it beforehand. The surface was very wet which resulted in poor braking action, and the rain had softened the surface to the extent that it could not support the weight of the nosewheel as the aircraft slowed.

FINDINGS:

Cause Related:

1. The grass runway was wet and soft from several days of rain.

2. The airstrip condition was not determined prior to the landing.

3. The nosewheel dug into the soft turf.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

CESSNA A185E C-FWKJ
CABRI, SASKATCHEWAN 25 mi W
01 JUNE 1985

REPORT NUMBER: 85-C50044 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0730 CST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,800	960
LAST 90 DAYS	45	45

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had just completed an aerial survey of a ranch and was landing at his private grass strip. After touchdown, the aircraft veered left. The pilot applied right rudder and brake, but directional control could not be regained. The aircraft turned through 180 degrees as it rolled off the left side of the strip. The right main gear collapsed during the turn.

The pilot stated that he landed the aircraft using full flap at about 50 mph and had slowed to about 35 mph before the aircraft started to veer. The reported surface wind at Swift Current, 35 miles southeast, was from the northwest at about 10 knots.

However, the pilot reported that the surface wind was calm when he landed.The pilot stated that he applied right brake as the aircraft veered left, but there was no response. The aircraft maintenance engineer, who later repaired the aircraft, stated that there was no evidence of a pre-occurrence failure or malfunction and that the right main gear had failed in overload.

The investigation did not determine why the pilot was unable to maintain directional control during the roll-out.

FINDINGS:

Cause Related:
1. For undetermined reasons, the pilot was unable to maintain directional control during the roll-out.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

CESSNA 185 C-FOVO
PAINT LAKE, MANITOBA
03 JUNE 1985

REPORT NUMBER: 85-C50031 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1045 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	800	250
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft was cruising at 500 feet above ground level on a visual flight, when the engine (Continental IO-470-F) lost power. The pilot ditched the aircraft in shallow water near the shore of a lake, where it nosed over and sank. The pilot did not have time to restart the engine.

The wet but uninjured occupants set up camp on a nearby island with survival equipment they retrieved from the aircraft. They were rescued by fishermen the next afternoon. The emergency locator transmitter (ELT) was rendered ineffective by water submersion.

When the aircraft was recovered from the lake, there were about three gallons of fuel in the tanks; the amount of unusable fuel for this aircraft is four gallons. There was no evidence of fuel leaking or siphoning. The engine was disassembled, cleaned, and reassembled; after reassembly, it ran without fault.

The day before the accident, the aircraft was reportedly fuelled to capacity and then flown for 55 minutes after which it was parked overnight in a farmyard.

During his preparation prior to the accident flight, the pilot did not visually inspect the amount of fuel in the tanks. The pilot stated that the left tank gauge indicated empty and the right tank gauge indicated some fuel when the engine stopped, although he did not rely on the gauges. The pilot had flown for a total of 2 hours and 35 minutes. Normal endurance is about 4 hours, 30 minutes. At the time the engine stopped, the pilot estimated that there still should have been fuel in the tanks for about one and one-half hours flying; however, the discrepancy between his calculations and the lack of fuel on board could not be explained.

The pilot had no suitable area in which to force-land, and he ditched the aircraft rather than land in trees.

FINDINGS:

Cause Related:

1. The pilot did not visually check the fuel amount before the flight.

2. The engine lost power because of fuel exhaustion.

3. The pilot ditched the aircraft because there was no suitable landing area.

Other:

-Nil-

* * *

CESSNA 140 C-FNUJ
TRUAX, SASKATCHEWAN 6 mi S
03 JUNE 1985

REPORT NUMBER: 85-C50032 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0845 CST
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private (Not Medically Valid)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	235	180
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was conducting a visual flight rules (VFR) flight from Carlyle to Hodgeville, Saskatchewan. In the vicinity of Truax, the pilot encountered rain and fog. Attempting to regain more favourable weather conditions while maintaining visual contact with the ground, the pilot initiated a turn. The aircraft struck a knoll and crashed in a water-filled slough. The pilot, who had loosened his lap belt earlier in the flight, was thrown from the aircraft into the water of the slough. He suffered minor injuries.

The aircraft weight and centre of gravity were within limits, and no aircraft discrepancies were reported. The pilot did not contact an accredited weather forecaster prior to departure. The pilot's licence validation certificate expired 01 February 1985, because a practical hearing test could not be accomplished prior to his medical expiry date.

Weather conditions were not suitable for VFR flight; the pilot did not have flight visibility of one mile.

FINDINGS:

Cause Related:

1. The pilot did not obtain weather briefing.

2. The pilot continued flight into weather conditions that were not suitable for visual flight, and he lost adequate visual reference with the ground.

3. As the pilot was attempting to turn out of weather, the aircraft struck rising terrain and crashed into a slough.

Other:

1. The pilot's licence validation certificate expired February 1.

* * *

HARVARD MKIV CF-UUU
HAMILTON AIRPORT, ONTARIO
4 JUNE 1985

REPORT NUMBER: 85-O50041 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1635 EDT
OPERATION: Private Other
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	17,860	215
LAST 90 DAYS	170	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was on final approach, when the engine (Pratt and Whitney R1340-SH1) stopped. The pilot, realizing that he would not be able to reach the runway, selected the landing gear up and force-landed the aircraft 600 feet short of the threshold.

The electrical components of the ignition system were examined, tested, and found to be functional. During a post-accident engine run-up, it was found that the fuel pump was leaking badly. The four screws securing the pump casing were tightened; the fuel leakage was reduced but not stopped.

The leaking fuel pump reduced the fuel pressure to the carburettor and caused the engine to stop from fuel starvation.

FINDINGS:

Cause Related:
1. The engine stopped because of fuel starvation caused by a leaking fuel pump.

Other:
- Nil -

✈ ✈ ✈ ✈ ✈

TAYLORCRAFT BC-12D C-FHIG
SHERWOOD PARK, ALBERTA 3 mi SW
06 JUNE 1985

REPORT NUMBER: 85-W50026 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2020 MDT
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	905	21
LAST 90 DAYS	.5	0

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The pilot completed extensive work on the engine, and prepared to test fly the aircraft. After experiencing considerable difficulty hand-starting the aircraft, the pilot took off from the grass runway. Just after take-off, the aircraft was observed to turn left at low altitude back toward the runway. During the turn, the aircraft descended and struck the ground at slow speed in a left-wing-low, nose-down attitude. The pilot was fatally injured.

PERTINENT INFORMATION:

An extensive examination of the engine (Continental A-65-8) revealed many discrepancies, some of which affected the ability of the four-cylinder engine to deliver power.

- The valve-to-rocker-arm clearance on the number one cylinder intake was less than the manufacturer's specifications;

- One of the two nuts required to hold the number two cylinder induction elbow in place was missing; and

- The screw and nut from the clamp that secures the throttle cable casing near the carburettor were missing.

Other discrepancies that were not accident related were also noted.

- The aircraft's Certificate of Airworthiness had expired, and a flight permit had not been obtained;

- There was a bird's nest in the wing;

- The aileron control cables were worn beyond serviceable limits;

- The engine oil screen was collapsed and covered with carbon particles; and

- The emergency locater transmitter (ELT) did not operate, because the automatic feature was corroded by the action of battery gases. The ELT contained a lithium battery. These batteries had been banned for use in ELTs in September 1977.

The pilot had removed the engine, carried out a partial overhaul, and reinstalled the engine. He was not a qualified aircraft maintenance engineer (AME), nor did he have an AME inspect or certify the work that was done.

The laboratory examination showed that the engine speed was about 875 rpm, and the indicated airspeed was about 40 mph at impact. The normal idle rpm would be just below 875 rpm, and normal operating rpm would be about 2,000 rpm. The published stall and spin speeds are 40 mph. Aircraft damage was characteristic of a ground impact while in an aerodynamic stall.

ANALYSIS:

Both the reduced valve-to-rocker-arm clearance and the loose induction elbow would have resulted in lower than normal engine power, but the pilot would have been aware of the power available during the take-off. However, slippage of the throttle cable casing would have resulted in the throttle arm moving toward the idle position, causing an immediate power loss while airborne, as confirmed by the engine impact rpm.

The engine lost power just after take-off, and the pilot attempted to return to the airstrip. During the turn, the aircraft stalled when it slowed to 40 mph, and a recovery was not effected.

The general condition of the aircraft indicated that the aircraft was not maintained in accordance with the manufacturer's or Transport Canada's requirements.

The following laboratory reports were completed: LP 142/85 - Instrument Analysis; LP 143/85 - ELT Analysis; LP 144/85 - Aileron Bellcrank and Cable; LP 153/85 - Exhaust Stack; and LP 159/85 - Throttle Control and Clamp.

FINDINGS:

Cause Related:

1. Movement of the unsecured throttle cable casing allowed the throttle arm to move toward the idle position, causing the airborne power loss.

2. Because of the power loss, the aircraft could not maintain flight, and it struck the ground.

3. The engine was reassembled without proper valve clearance, and there was a nut missing on an induction manifold, both of which caused the engine to produce less than normal power.

Other:

1. The ELT was unserviceable because of the use of a lithium battery.

2. The aileron cables were worn beyond serviceable limits.

3. The engine oil screen had collapsed because of carbon accumulation.

4. The aircraft's Certificate of Airworthiness had expired.

5. There was no flight permit obtained for this flight.

* * * * *

RISK OF COLLISION BETWEEN:
CESSNA 150G C-GWGU and
BOEING 737 C-GPPW
KELOWNA AIRPORT, BRITISH COLUMBIA
06 JUNE 1985

LOCAL TIME: 1250 PDT
INFORMATION SOURCE: Field Investigation

CESSNA 150G C-GWGU
REPORT NUMBER: 85-P54016 (Incident)
OPERATION: Private Recreational
DAMAGE: None
PILOT LICENCE: Private

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

BOEING 737 C-GPPW
REPORT NUMBER: 85-P54016 (Incident)
OPERATOR: Pacific Western Airlines
OPERATION: Scheduled Domestic
DAMAGE: None
PILOT LICENCE: Airline Transport

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	Not Available
PASSENGERS	-	-	Not Available

SUMMARY REPORT:

The Boeing 737, Pacific Western Flight 197, was backtracking to the take-off position for runway 15, when the Cessna 150 was cleared to "taxi to position on the west side of runway 15" and instructed to "check the Boeing backtracking". The pilot taxied the Cessna onto the runway, and, after a short pause, he applied power and took off. The Cessna passed about 50 feet over the Boeing at the half-way point of the runway.

Heavy aircraft routinely backtrack at Kelowna because the taxiway is restricted to 20,000 pounds maximum weight.

The Cessna pilot stated that he had limited experience at controlled airports and that he was not always able to understand all of a radio transmission. He was reluctant to request clarification. The Cessna pilot understood that he was cleared onto the runway but was not sure if he had take-off clearance. He was aware of the presence of the Boeing. He heard the following transmission immediately after his clearance to the runway: "197 check I have a light one taxiing to position. I'll get him off ahead of you." The Cessna pilot decided to get out of the way of the Boeing, so he took off.

The controller issued instructions to the two aircraft believing that the information was adequate to prevent any conflict between them. He did not anticipate that the Cessna would take off without clearance, and the controller was taken by surprise. By the time the controller realized the Cessna was taking off, it was too late to stop it.

FINDINGS:

Cause Related:

1. The pilot of the Cessna 150 took off without take-off clearance because he did not fully understand the taxi clearance he had received, nor the information that was passed to the Boeing.

Other:

-Nil-

* * * * *

CESSNA 177 C-GEHZ
KINCAID, SASKATCHEWAN 1 mi W
07 JUNE 1985

REPORT NUMBER: 85-C50035 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2030 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	276	194
LAST 90 DAYS	14	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was completing a cross-country flight from Regina to a farm strip at Kincaid, Saskatchewan. He planned to touch down on the button of the runway to ensure that the aircraft could clear a power line on the west end of the airstrip, in the event of a missed approach. While the pilot was turning onto final, the aircraft's main landing gear struck a 14-foot-high mound of dirt. The aircraft bounced, then landed hard, 200 feet short of the runway, and the landing gear was sheared off.

The surface wind was from the west at 20 to 25 knots. It had been two years since the pilot had landed at this strip, and he had forgotten about the 14-foot-high mound of dirt, 329 feet from the button of the runway. In addition, the sun was low on the western horizon, and, as a result, the pilot's forward vision was limited by the sun's glare, and he did not see the mound of dirt. In order to touch down on the button of the runway and ensure that he had adequate obstacle clearance, the pilot flew a shallower than normal approach, which resulted in the aircraft striking the mound of dirt.

FINDINGS:

Cause Related:

1. The pilot flew a shallower than normal final approach and struck a mound of dirt located 329 feet from the button of the runway.

2. Because of the sun's glare, the pilot did not see the mound of dirt.

Other:

- Nil -

* * * * *

PIPER PA-28 R200-1A N774LR
CANADIAN FORCES BASE
PORTAGE, MANITOBA
08 JUNE 1985

REPORT NUMBER: 85-C54901 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1610 CDT
OPERATION: Private Recreational
DAMAGE: Minor
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	127	10
LAST 90 DAYS	14	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot departed Rapid City, South Dakota at 1055, on a visual flight rules (VFR) flight to Brandon, Manitoba. About 60 miles south of Brandon, the flight visibility deteriorated rapidly in blowing dust. The pilot descended but was unable to maintain visual contact with the ground; so he climbed to get above the dust and clouds. He contacted Brandon tower during the climb and advised them that he was unsure of his position, that he had 30 to 40 minutes of fuel remaining, and he requested assistance. After discussing the weather and various options, the pilot decided to divert to Canadian Forces Base (CFB) Portage. With assistance from Winnipeg Centre and Portage radar controllers, the pilot was vectored to a point where he visually acquired the Portage Airport. Because of the reduced visibility, the pilot crossed over the airfield at least twice before he was able to set up for a landing. On final turn to land, the engine lost power when the left fuel tank ran dry; however, it restarted when the pilot selected the right tank on. The pilot landed the aircraft, with the landing gear retracted, heading 310 degrees on the unused portion of runway 31R.

The aircraft was equipped for instrument flight rules (IFR) flight, but the pilot was not IFR rated. The only navigation aid installed and operable in the aircraft was a very high frequency omni-directional range (VOR) receiver; the aircraft distance measuring equipment (DME) was not operating.

The weather conditions encountered were considerably worse than those forecast prior to the pilot's departure from Rapid City. Primarily, high winds caused moderate to severe turbulence and reduced visibility in blowing dust. The weather at Portage had deteriorated while the aircraft was en route from the Brandon area; the visibility on landing was less than one-half mile, and the wind was 260 degrees at 30 to 35 knots.

The aircraft is equipped with an automatic landing gear system which the pilot had overridden to the "up" position, because he did not want the gear to extend prematurely. Just prior to touchdown, the pilot selected the landing gear down, but the landing gear had just started to extend when the aircraft landed. The pilot was experiencing such difficulty coping with the low visibility, high winds, and severe turbulence, especially as he was not IFR trained, that he neglected to complete the pre-landing check. Although the pilot reported that the landing gear system had not functioned properly, subsequent tests failed to reveal any faults with either the automatic or manual system.

FINDINGS:

Cause Related:

1. Coping with the engine stoppage, high winds, low visibility, and severe turbulence so distracted the pilot that he did not complete the pre-landing check.

2. The aircraft landed wheels up because the landing gear was not selected down soon enough to allow it to extend.

Other:

- Nil -

* * *

AERONCA 7AC C-FOHS
PORT HOPE, ONTARIO 1 mi NW
15 JUNE 1985

REPORT NUMBER: 85-O50045 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1430 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	63	9
LAST 90 DAYS	34	9

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot carried out a short steep approach to land on a small private airstrip. His approach speed was 10 mph less than normal. The aircraft touched down heavily on the main wheels and bounced several times. The tail wheel springs became detached from the steerable tail wheel arm, and, during the landing roll, the pilot attempted to control with left and right pedal inputs. The aircraft veered left off the runway and came to rest in a shallow ditch.

The pilot reported that although he felt uncomfortable with the approach, he was reluctant to carry out an overshoot because he wished to demonstrate to his passenger that he was able to land successfully.

According to the evidence the pilot did not flare the aircraft sufficiently prior to touchdown. The high rate of descent on touchdown caused the aircraft to bounce. The heavy landing caused the tail wheel springs to fall off the tail wheel arm, and, without the springs, the pilot would have had a tendency to overcontrol pedal input. As a result, the pilot was unable to maintain directional control, and the aircraft veered off the runway.

FINDINGS:

Cause Related:

1. The pilot elected to continue a steep approach at low airspeed rather than overshoot.

2. Following the steep, slow approach, the pilot did not flare sufficiently; the aircraft landed hard, and the tail wheel springs became detached from the tail wheel steering arm.

3. The pilot was unable to maintain directional control following the loss of the tail wheel springs.

Other:
-Nil-

* * * * *

CESSNA 150 CF-YLX
KINGSTON AIRPORT, ONTARIO
25 JUNE 1985

REPORT NUMBER: 85-O50049 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1238 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	40	3
LAST 90 DAYS	5	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During the landing in an eight-knot cross-wind from the left, the aircraft landed hard, bounced into the air, and began to drift to the right. The pilot pushed the control column forward, and the aircraft landed hard again on the nosewheel, causing it to collapse. The right wing struck the ground, and the aircraft came to a stop on the runway.

The pilot did not employ the correct bounce recovery procedure. This resulted in the hard landing on the nose gear and the failure of the nose gear assembly. In addition, the pilot did not correct for the cross-wind drift during the bounce, and, as a result, the right wing struck the ground when the nose gear failed.

FINDINGS:

Cause Related:
1. The aircraft was allowed to land hard and bounced back into the air.

2. The incorrect bounce recovery technique employed by the pilot resulted in a second hard landing and collapse of the nose gear.

3. During the bounce, the aircraft was allowed to drift to the right in the cross-wind, and, as a result, the right wing struck the ground after the nose gear collapsed.

Other:
- Nil -

* * * * *

BELLANCA 8KCAB C-GNFN
LONDON, ONTARIO, 6 mi N
25 JUNE 1985

REPORT NUMBER: 85-O50048 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,200	34
LAST 90 DAYS	10	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had taken off from a 2,100-foot-long sod strip and had completed one circuit. He landed back on the strip, intending to carry out a touch-and-go landing. During the second take-off run, the aircraft ran over a rise two-thirds of the way down the strip. The aircraft drifted to the right, left the strip, travelled through a corn field, and stopped after striking several trees along a fence.

During the take-off, there was a steady seven-knot, 80-degree cross-wind from the left. When the aircraft passed over the rise, it became light on its wheels, and the cross-wind caused the aircraft to drift sideways. The pilot did not correct for the drift, and the aircraft ran off the runway. The pilot did not reduce power until after the aircraft had struck the trees.

FINDINGS:

Cause Related:
1. The correct cross-wind technique was not used during the take-off run.

2. There was no attempt made to reject the take-off after the aircraft ran off the side of the runway.

Other:
- Nil -

* * * * *

ENGINEERING AND RESEARCH CORP
ERCOUPE 415-C CF-NMS
OAKWOOD, ONTARIO 2 mi N
27 JUNE 1985

REPORT NUMBER: 85-O50050 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1430 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	500	15
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot was returning to land at a private airport after a local flight. On final approach and just before the threshold, the pilot reduced the power. The aircraft struck a rail fence near the threshold; contact with the fence broke the steering arm, which allowed the nosewheel to cock. Following touchdown, the nosewheel skidded, the nose landing gear partially collapsed, and the aircraft nosed over.

Investigation found that the pilot had just purchased the aircraft and was not fully familiar with its performance. When the power was reduced, this aircraft had a higher sink rate than the aircraft with which he was familiar. The pilot reduced the power prematurely for this aircraft, and, because of its high sink rate, the aircraft struck the fence.

FINDINGS:

Cause Related:

1. The aircraft struck the fence because the pilot reduced the power prematurely.

2. The pilot was unfamiliar with the performance of this aircraft type.

Other:
-Nil-

* * * * *

CESSNA 172D N2184Y
SMITHERS, BRITISH COLUMBIA 30 mi S
30 JUNE 1985

REPORT NUMBER: 85-P50905 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1135 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	180	40
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	1	-

SUMMARY REPORT:

The pilots and passengers of two Cessna 172 aircraft departed on a fishing trip from Spokane, Washington and proceeded to Kamloops, British Columbia via Penticton. Both aircraft were refuelled in Kamloops, and the flight continued to Twin Lakes. The pilots spent three days in Twin Lakes and then departed for Terrace where the aircraft were to be refuelled.

Once airborne, the pilots filed visual flight rules (VFR) flight plans which indicated that they intended to make 30-minute en route stops at Anahim Lake and Phillips Lakeside Lodge airstrips.

The pilots flew to both these airstrips; however, due to strong cross-winds at both locations, they decided not to land and to continue on towards Terrace. Deteriorating weather was encountered, and both aircraft then diverted to Smithers. Thirty miles south of Smithers N2184Y's engine stopped, and the pilot force-landed the aircraft in trees. The pilot of the other aircraft, N54036, advised the Smithers flight service station (FSS) operator of the accident, and a rescue helicopter was dispatched to the scene.

Examination of the wreckage revealed that the fuel tanks were empty. The engine was removed and tested. It started easily and, when operated at 2,250 rpm, burned fuel at a rate of 10.5 US gallons per hour. The aircraft has a usable fuel capacity of 39 US gallons. Total flight time between the refuelling stop in Kamloops to engine stoppage was 3 hours and 35 minutes.

The satisfactory performance of the engine after removal from the accident scene and the lack of fuel in the tanks indicate that the engine stopped due to fuel exhaustion. The pilot had not intended to refuel at Anahim, although fuel was available there. He did not ensure that sufficient fuel was carried on board to successfully complete the flight. Canadian regulations require VFR flights to carry fuel sufficient to reach destination plus a 45-minute reserve.

Although the aircraft was diverted to Smithers because of the deteriorating weather, the fuel exhaustion position was about mid-way between Terrace and Smithers. It is therefore unlikely that the trip could have been completed to the initial point of intended landing with the fuel on board, except under ideal conditions and then the flight would have been carried out without a reserve. Had pre-flight preparation been completed, the pilot would have been aware that insufficient fuel was carried on board to complete the flight.

The second aircraft, a different model year, with a different engine, landed safely in Smithers after an additional 15 minutes flying time. This aircraft consumed a total of 34.8 US gallons.

FINDINGS:

Cause Related:

1. The pilot did not ensure that the aircraft contained sufficient fuel for the flight.

2. The engine stopped as a result of fuel exhaustion.

Other:
-Nil-

* * * * *

PIPER PA18-150 SUPER CUB C-GRZO
BELWOOD, ONTARIO
1 JULY 1985

REPORT NUMBER: 85-O50052 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1255 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	148	33
LAST 90 DAYS	16	16

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft which was towing a glider began its take-off in light cross-wind conditions. As the aircraft progressed down the runway, it began to veer to the right. The aircraft became airborne near the edge of the runway where the landing gear and propeller struck some grain growing at the side of the runway. The landing gear became tangled in the grain, and the aircraft settled, flipped over, and came to rest on its back. The glider disengaged as the tow aircraft left the side of the runway and landed on the runway remaining.

The pilot did not maintain directional control both on the runway and once airborne, allowing the tow aircraft to drift off the runway. When the aircraft contacted the grain, the landing gear became tangled in the grain and the aircraft flipped over.

FINDINGS:

Cause Related:

1. The pilot did not maintain directional control during a take-off in a cross-wind.

2. The aircraft landing gear and propeller struck the grain growing at the side of the runway, the landing gear became tangled in the grain, and the aircraft flipped over onto its back.

Other:
- Nil -

* * * * *

CESSNA 414 N4639G
KENORA, ONTARIO 20 mi NNE
01 JULY 1985

REPORT NUMBER: 85-C50902 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1450 CDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Private (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,400	1,000
LAST 90 DAYS	30	30

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	3	-	-

SUMMARY REPORT:

The aircraft departed Red Lake, Ontario on a visual flight rules (VFR) flight to Duluth, Minnesota. On board were the pilot, his adult son in the right front seat, and two adult male passengers in the rear seats. About 15 minutes after take-off, the pilot's son transmitted a MAYDAY and stated that the pilot had had a "heart attack or a fit" and was totally incapacitated. The son stated that neither he nor anyone on board knew how to fly an airplane, and he requested help. The Kenora radar controller established radio and radar contact with the aircraft and did his utmost to help the passenger maintain level flight through verbal instructions. As well, the controller succeeded in talking the passenger through a turn toward Kenora. The passenger then declared that he had lost control of the aircraft; through his radio transmissions, it was evident that the aircraft was undergoing changes in pitch and altitude, and the passenger did not know how to recover control. Radio and radar contact was lost 14 minutes after the MAYDAY call. The aircraft was discovered the following day. It had crashed into a bush area at an angle of about 80 degrees nose down and at moderate airspeed, indicating that the aircraft had stalled at low level.

A bottle containing Procardia (Nifedepine) tablets, prescribed for the pilot, was found among the pilot's personal effects at the crash site. Procardia (Nifedepine) is normally used for the treatment of coronary artery disease and hypertension. The pilot had suffered chest pains, was concerned about his cardiac system, and was being treated for hypertension. Although the Federal Aviation Authority (FAA) was unaware that this pilot was using the drug, Procardia has been prescribed for other active American pilots with FAA knowledge and acceptance.

The autopsy report confirmed that the pilot had suffered a heart attack. The passenger who attempted to fly the aircraft had had no flight training.

FINDINGS:

Cause Related:

1. The pilot suffered a heart attack and became incapacitated.

2. A passenger attempted to fly the aircraft but was unable to control it because he did not know how to fly.

3. The aircraft stalled at low altitude and struck the ground.

Other:

1. The pilot was being treated for hypertension.

2. The FAA had not been made aware that the pilot was suffering from hypertension.

* * * * *

CESSNA A188B C-GACC
WAWOTA, SASKATCHEWAN
02 JULY 1985

REPORT NUMBER: 85-C50050 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0645 CST
OPERATION: Private Aerial Spray
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,000	600
LAST 90 DAYS	100	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was carrying out an aerial spray operation from a dirt strip. Initial take-off acceleration appeared to be normal; however, flying speed was not attained prior to the aircraft running off the end of the strip. The aircraft travelled about 300 feet into an adjacent wheat field, before the left main gear collapsed. The spray load was not dumped.

The farmer told the pilot that the dirt strip was 2,800 feet long. The pilot did not confirm the take-off run available. The computed take-off distance for the aircraft, under the conditions present, was about 1,100 feet. The pilot mentioned having difficulty taking off in the distance available on several previous occasions. There were no reported aircraft deficiencies, and the aircraft was correctly configured for the take-off at 500 pounds below its maximum allowable gross weight. The pilot stated that the wind shifted to a five-knot tail wind just before he attempted the take-off.

The cause of the accident was undetermined.

FINDINGS:

Cause Related:
1. For undetermined reasons, the aircraft did not attain flying speed in the take-off distance available.

Other:
1. The pilot did not confirm the distance available for take-off, although he had experienced difficulty taking off from the strip on previous occasions.

* * * * *

CESSNA 180H C-FXCQ
PIKANGIKUM, ONTARIO
09 APRIL, 1984

REPORT NUMBER: 84-C44012 (Incident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1200 EST
OPERATION: Private Ferry
DAMAGE: Minor
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	640	110
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

As the ski-equipped aircraft was being taxied downwind for take-off, it broke through the ice and sank to the point where the wings and tail came to rest on the ice.

The ice surface was covered with about four inches of water and slush. The pilot had asked one person about the ice condition and was told that the ice was good everywhere. The pilot did not examine the condition of the ice surface before he taxied the aircraft.

FINDINGS:

Cause Related:
1. The ice was not strong enough to support the weight of the aircraft.

2. The pilot did not make an adequate assessment of the ice condition, given the fact that there was water and slush on the ice surface.

Other:
-Nil-

* * * * *

CESSNA U206G C-GBNZ
FORRESTOR'S POINT, NEWFOUNDLAND
13 APRIL 1984

REPORT NUMBER: 84-A40004 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1500 AST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,329	268
LAST 90 DAYS	150	150

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW			1
PASSENGERS		-	-

SUMMARY REPORT:

The ski-wheel aircraft had just become airborne, when the engine (Continental IO-520-F) started to vibrate, and a loud banging noise was heard. The odour of burning oil was also noticed. The engine was shut down, and a forced landing was carried out on a snow-covered ice airstrip. The aircraft touched down heavily, and the nose gear collapsed. The aircraft had six hours flying time since its last 100-hour inspection.

The number five cylinder head was severely cracked. The presence of combustion by-products on the fracture surfaces indicated that the cracks had been in existence for some time; however, they were not detected during the 100-hour inspection. An engine cylinder compression check would have revealed the cracks. Although the engine manufacturer recommends that a compression check be carried out during the 100-hour inspection, the aircraft manufacturer does not. Transport Canada recognizes the aircraft manufacturer's recommended inspection program.

The cylinder head cracks originated in the exhaust port area of the cylinder head. The cracks were most probably caused by thermal fatigue as a result of high cylinder head temperatures under continuous heavy duty service conditions. The severe vibrations and noise were caused by the failure of the cylinder head while the engine was operating at maximum take-off power condition. The hard landing caused the nose gear to collapse forward.

The following laboratory report was completed:
LP 181/84 - Cylinder Failure.

FINDINGS:

Cause Related:
1. The number five cylinder head cracked because of thermal fatigue associated with engine operation at high cylinder head temperatures.

2. The cracks, which had been in existence for some time, were not detected during the last 100-hour inspection.

3. The nose gear collapsed because of the hard landing.

Other:
1. The aircraft manufacturer's 100-hour inspection program, which is recognized by Transport Canada, does not require that a compression check be carried out.

* * * * *

CESSNA A185F C-GYKI
GAGNON LAKE, NORTHWEST TERRITORIES
07 MAY, 1984

REPORT NUMBER: 84 W40030 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1400 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	700
LAST 90 DAYS	120	120

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot landed the wheel/ski-equipped aircraft on a frozen lake and initiated a high speed left turn. During the turn, the right wheel/ski assembly broke off, and the right gear leg dug into the snow and collapsed. The aircraft dropped onto its right wing and slid to an abrupt stop.

Examination of the right wheel/ski assembly revealed that the attachment bolts had failed because of an excessive side load. It was also established that marginal stopping distance remained between the touchdown point and the tree-covered shore.

The investigation determined that the pilot initiated a left turn because of the marginal distance remaining to complete the landing run. The left turn imposed a side load which caused the landing gear failure.

FINDINGS:

Cause Related:
1. Because of the marginal stopping distance remaining, the pilot initiated a high speed left turn.

2. The left turn imposed an excessive side load which caused the landing gear to fail.

Other:
-Nil-

* * * * *

CESSNA 185 C-FMYM
GOUIN DAM, QUEBEC
08 JUNE 1984

REPORT NUMBER: 84-Q40030 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1600 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	380	275
LAST 90 DAYS	30	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	1	-	2

SUMMARY REPORT:

The pilot and his three passengers had just taken off from a lake surrounded by hills. After take-off, at about 10 feet above the lake surface, the aircraft encountered a strong gust of wind, and the left wing lifted. The pilot attempted to correct, but the right wing tip struck the water, and the aircraft overturned. Since both wings had been displaced and were bent over the doors, the aircraft was evacuated through a window. The pilot and two passengers exited the aircraft uninjured; the third passenger was taken out of the aircraft. Despite rescue efforts, he drowned.

A westerly wind at 15 gusting to 25 knots had been reported. The high hills surrounding the lake greatly affected wind strength and direction. As a result, the wind speed and direction were very different from the conditions assessed by the pilot before take-off.

FINDINGS:

Cause Related:

1. After take-off, a strong gust of wind lifted the left wing.

2. The pilot was unable to compensate for the roll before the right wing struck the lake surface.

Other:

1. Evacuation of the aircraft was hindered by the wings which were bent over the doors.

* * * * *

CESSNA R172K C-GUZU
LAC SIMON, QUEBEC
11 JUNE 1984

REPORT NUMBER: 84-Q40035 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1709 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private (Tourist)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	103	6
LAST 90 DAYS	6	6

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The aircraft landed on the water into a steady 10-knot head wind. During the deceleration phase, the aircraft leaned to the right; the right wing tip dug into the water, and the aircraft flipped onto its back.

One of the top wirepull tie rods that align the two floats was found fractured. Laboratory examination revealed that the tie rod had failed in overload. The front wirepull tie rod showed indications of tie rod rub, and the rod cross-section was reduced by 25 per cent. The reduced cross-section resulted in the static load strength being reduced to 21 per cent below the manufacturer's minimum specification. The rubbed area would act to concentrate any dynamic stress loads in the area of the rub. The manufacturer's Engineering Drawing 36685 and Packing List Drawing 248B1293, which are used for rigging the floats, indicate that there should be a gap between the two tie rods.

The fact that tie rod rub occurred indicates that the floats were misrigged, permitting the tie rods to rub against each other. As a result, the tie rod failed at load levels below the normal load failure level.

The following laboratory report was completed:
LP 207/84 - Wing Support Structure.

FINDINGS:

Cause Related:

1. The aircraft floats were misrigged, permitting abnormal wear of the tie rod and resulting in the tie rod failing at below normal landing load levels.

2. The aircraft overturned when the right wing dug into the water.

Other:

-Nil-

* * * * *

CESSNA 180J C-GAHL
BILKIE LAKE, ONTARIO
11 JUNE 1984

REPORT NUMBER: 84-C40034 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1500 EDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	900	900
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

Just after the aircraft became airborne from the lake, it drifted right and descended out of control. The aircraft struck the water in a near-level attitude; the right float dug in, and the aircraft rolled over and sank.

There were no reported aircraft malfunctions, and the aircraft was apparently within weight and balance limits. The lake is bordered on the west side by fairly high hills and trees, and the wind was from the west estimated at 20 gusting to 30 knots. The aircraft was on a northwesterly heading on take-off.

The pilot was unable to maintain control of the aircraft during the take-off in strong gusty winds. The aircraft rolled over on touchdown because it was not in a landing attitude and because it was drifting sideways.

FINDINGS:

Cause Related:
1. The pilot attempted to take off in strong gusty winds and was unable to maintain control of the aircraft.

Other:
-Nil-

* * *

CITABRIA CHAMPION C-GOPG
VICTORIA INTERNATIONAL (Patricia Bay), BRITISH COLUMBIA
15 JUNE 1984

REPORT NUMBER: 84-P40023 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2119 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	13
LAST 90 DAYS	13	13

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot and one passenger departed Shawinigan Lake, British Columbia and flew directly to Patricia Bay, about eight miles east, where they landed heading in a northeasterly direction. The float-equipped aircraft landed hard on the top of a wave, which resulted in damage to some of the float attachments and the left wing tip when it briefly contacted the water.

The investigation revealed no pre-accident malfunctions or failures; however, the pilot reported that the two-way radio was operating intermittently. There were high scattered clouds in the area, the wind was westerly at about 10 knots, and the temperature was 13 degrees Celsius. Sunset was calculated to have been at 2112 PDT.

The pilot approached and landed downwind without checking the surface conditions at the landing site. The Water Aerodrome Supplement states that west winds can cause the bay to be rough. Although the pilot was aware of this condition, he did not expect the waves to be as large as they were. The high touchdown speed resulting from the downwind landing added to the landing shock.

Although the landing area is in the Victoria positive control zone, the pilot did not establish radio contact with air traffic control, nor did he comply with the published arrival procedures for NORDO (no radio) aircraft.

The following laboratory report was completed:
LP 215/84 - Load and Failure Analysis; Bracing Wires.

FINDINGS:

Cause Related:

1. The pilot landed without first checking the condition of the landing area.

2. The downwind landing resulted in a high touchdown speed.

3. The shock from landing at high speed on the large waves exceeded the structural limits of the aircraft.

Other:

1. The pilot did not comply with established procedures for entering a positive control zone.

* * * * *

CESSNA 172K C-GYAW
LAC FRONTIERE, QUEBEC
24 JUNE 1984

REPORT NUMBER: 84-Q40038 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0900 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPE	ON TYPE
TOTAL	414	301
LAST 90 DAYS	23	23

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The float-equipped aircraft was taking off for a local flight. During the take-off run, just as the aircraft was on the step, a gust of wind lifted the left wing. The right wing contacted the water surface, the aircraft pivoted to the right and then overturned. The pilot was rescued by witnesses.

The investigation revealed that the aircraft took off in a southerly direction with a 10- to 15-knot head wind. Immediately before the accident, a witness reported gusts of wind from the southeast. The evidence indicates that, while on the step, the aircraft encountered a gust of wind, and the pilot was unable to maintain control.

FINDINGS:

Cause Related:

1. While on the step, the aircraft encountered a gust of wind, and the pilot was unable to maintain control.

Other:

-Nil-

* * * * *

CESSNA A185E C-GHZM
HOPE, BRITISH COLUMBIA 15 mi NE
29 JULY 1984

REPORT NUMBER: 84-P40040 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0915 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	14,000	700
LAST 90 DAYS	Unknown	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	4

SUMMARY REPORT:

The pilot and four passengers took off from Burnaby Lake, British Columbia, on a visual flight rules (VFR) flight. About 45 minutes after take-off, the aircraft entered a narrow valley with steep sides and gradients. The pilot attempted to reverse course; however, the aircraft stalled during the turn and crashed into tall, dense trees; the pilot was seriously injured.

The investigation revealed no pre-crash malfunction or failure. The weather was good with the visibility at Hope, British Columbia reported as greater than 15 miles; the pilot reported some haze.

The pilot was familiar with this mountainous area; however, for this flight, he chose a route that he had not flown before. He turned into a valley he thought was Dewdney Creek, but it soon became apparent that the valley was a different one with steep gradients and little room to turn an aircraft. The aircraft performance was not sufficient to allow it to clear the surrounding slopes, and the aircraft stalled during the pilot's attempt to turn around in the confined area.

During the crash, the antenna for the emergency locator transmitter (ELT) broke off, rendering the ELT unserviceable. Discovery of the crash site took 22 hours after notification; this time undoubtedly would have been reduced had the ELT been operable. The calculated centre of gravity of the aircraft was slightly aft of the allowable range, but this was not considered significant in the accident.

FINDINGS:

Cause Related:
1. The pilot inadvertently flew into a valley from which he could not make a safe exit, and the aircraft stalled during the pilot's attempt to reverse course.

Other:
1. The ELT antenna broke off during the crash and rendered the ELT unserviceable.

* * * * *

CESSNA 185A C-FSJW
LAC D'ARGENT, QUEBEC
20 AUGUST 1984

REPORT NUMBER: 84-Q40061 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1800 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	474	400
LAST 90 DAYS	14	14

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot reported making a hard landing after the aircraft engine (Continental IO-520-D) lost power at approximately 50 feet above water level, during take-off. On landing, the floats and support structure sustained damage.

The pilot could not duplicate his engine problem, so he took off again after making temporary float repairs. He subsequently had a repair party ferry the aircraft to Lac à la Tortue for repairs. At no time did he inform the ferry pilot of the engine problem. Subsequent engine testing failed to indicate any engine malfunction.

FINDINGS:

Cause Related:
1. The engine lost power after take-off for undetermined reasons, resulting in a hard landing.

Other:
1. The pilot did not inform the ferry pilot of possible engine problems.

* * * * *

CESSNA 180A C-FIZL
LAC BLANCHARD, QUEBEC
24 SEPTEMBER 1984

REPORT NUMBER: 84-Q40077 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1435 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	189	50
LAST 90 DAYS	62	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

After executing a low pass at reduced power over a lake on which he had decided to land, the pilot pulled up to make a circuit. He put the aircraft in a nose-up attitude, and the engine misfired several times. The pilot reduced the pitch angle and then confirmed that the fuel tank selector valve was set to the right tank. This check had just been completed, and the aircraft was at an altitude of about 200 feet when the engine stopped. The float-equipped aircraft was too far from the lake to glide, and the pilot made a forced landing into trees. The float-equipped aircraft came to rest in a nearly vertical nose-down attitude.

No pre-impact mechanical malfunction was discovered, and the tanks still contained fuel after the accident. The investigation also established that, at the time of the accident, the temperature and dew point were 12 degrees Celsius and 2 degrees Celsius. These conditions are conducive to carburettor icing. The pilot stated that he made two low passes over the lake and at no time did he use carburettor heat. The Cessna 180 owner's manual recommends that the carburettor heat control be set to the maximum heat position before reducing power for a descent. The manual also indicates that the fuel tank selector valve must be in the BOTH position before landing. Furthermore, the pilot stated that he did not use the check-list.

All the indications are that ice accumulated in the carburettor, resulting in the misfiring and subsequent engine stoppage. The pilot believed that the problem was related to fuel supply, but he did not think of carburettor icing.

FINDINGS:

Cause Related:
1. The cause of the accident was not determined.

Other:
1. Contrary to the manufacturer's recommendations, the pilot did not activate the carburettor heat before descending, and ice accumulated in the carburettor.

2. Contrary to the manufacturer's recommendations, the fuel tank selector valve was not in the BOTH position before landing.

3. The pilot did not use the check-list.

* * * * *

CONSOLIDATED AERONAUTICS
LAKE LA-4 (Amphibious) CF-SUP
LAC DES TROIS MONTAGNES, QUEBEC
13 OCTOBER 1984

REPORT NUMBER: 84-Q40085 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1750 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,087	932
LAST 90 DAYS	62	62

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot had just landed the float-equipped aircraft on Lac Trois Montagnes, Quebec, in smooth surface conditions. The landing was long, and in order to shorten the landing run, the pilot began a turn to the left while the aircraft was still on the step. The right float dug into the water, and the aircraft slewed to the right. The aircraft nose went up in the air, and the tail section hit the water heavily. The pilot taxied to the shore, where he discovered that the fuselage had been damaged. Turning the aircraft at step speed is a recommended procedure in the pilot's operating manual. Although the pilot had employed this procedure before, it appears that, on this occasion, he allowed the right wing to drop. As a result, the right float dug into the water, and the pilot lost control of the aircraft.

FINDINGS:

Cause Related:
1. While the pilot was attempting a turn during the landing run manoeuvre, the right float dug into the water; as a result, control of the aircraft was lost.

2. During the loss of control, the tail section struck the water, damaging the fuselage.

Other:
-Nil-

* * * * *

CESSNA R172K C-GYLG
RESERVOIR DECELLES, QUEBEC
30 OCTOBER 1984

REPORT NUMBER: 84-Q40090 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1645 EST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	2,000
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

During the day of the accident, the pilot had landed at Reservoir Decelles three times in the float-equipped aircraft. On the approach for his fourth landing, he overshot because of strong gusty winds. The pilot landed the aircraft off the next approach. As it came off the step, the aircraft veered to the right, and the pilot closed the throttle and applied full left rudder. The left wing lifted, and the aircraft overturned. Because the winds were so strong, the pilot had not extended the flaps for landing.

The pilot reported that on the approach toward the south, the wind was varying from the southwest to the southeast at 40 miles per hour with gusts. He had not obtained a weather forecast for the flight. There were no reported pre-accident aircraft malfunctions or failures.

The pilot stated that he had about 300 flying hours on float-equipped aircraft and that he had applied for a float endorsement. No record of the application or the endorsement was found.

The pilot landed the aircraft in wind conditions that would have made directional control difficult, even for an experienced float-plane pilot. The pilot knew that winds were unpredictable and strong, as evidenced by his overshoot and the fact that he landed with the flaps up.

FINDINGS:

Cause Related:
1. Strong gusty winds caused the pilot to lose control of the aircraft during the landing.

Other:
1. The pilot was not licensed to operate a float-equipped aircraft.

* * * * *

AERONCA 11AC C-FFMU
GYPSY LAKE, ALBERTA
05 JANUARY 1985

REPORT NUMBER: 85-W50003 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1255 MST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	264	82
LAST 90 DAYS	19	19

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

After the ski-equipped aircraft had touched down on a frozen lake, the skis dug into a snowdrift, and the landing gear collapsed.

The site that the pilot selected for landing was a snow-covered frozen lake on which there were areas of small hard-packed snowdrifts. An area of smoother snow was available closer to shore. The investigation determined that the pilot selected an unsuitable area for landing.

FINDINGS:

Cause Related:
1. The area selected for landing was unsuitable for this ski-equipped aircraft.

2. After the aircraft landed, the ski dug into a snowdrift and the landing gear collapsed.

Other:
-Nil-

* * * * *

CHAMPION 7GC C-FOVD SUNSET BAY, LAC DU BONNET, MANITOBA
05 JANUARY 1985

REPORT NUMBER: 85-C50002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1315 CST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	300
LAST 90 DAYS	35	29

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	1

SUMMARY REPORT:

In preparation for a local pleasure flight, the pilot and his passenger boarded the two-seater ski-equipped airplane and fastened their seat-belts. From the front seat, the pilot taxied the aircraft left through a 180-degree turn on the snow-covered lake, then applied power for take-off. When the tail ski lifted, the aircraft veered left. The pilot applied right rudder, but the aircraft continued to veer toward a steep embankment. Realizing impact was imminent, the pilot closed the throttle and pulled back on the control column. The aircraft rose slightly and struck the top of the embankment. The aircraft slewed 90 degrees and came to rest in some scrub on the shore. The pilot was seriously injured.

The reported weather was ceiling and visibility unlimited (CAVU), wind calm, and temperature zero degrees Celsius. The take-off was carried out on a wide, frozen bay suitable for ski operations. The snow condition was soft and sticky.

No pre-occurrence performance irregularities were reported; wreckage examination revealed no evidence of pre-impact structural or mechanical failure.

The pilot believed that he might have inadvertently hooked his seat-belt around the left rear rudder pedal while strapping himself into the seat. He thought this would have restricted the rearward movement of the pedal, thereby precluding full right rudder travel. During the investigation, several attempts to duplicate this condition were made. The relative positions of the seat-belt attachment point and the left rear pedal made it difficult to hook the belt around the pedal. Once the belt was routed in this manner and secured around a front-seat occupant, moderate pressure on the front left rudder pedal caused the interconnected rear pedal to pull free of the belt. The occupant felt the belt tighten as the pedal moved forward, then return to normal when the pedal pulled free. The pilot had not felt anything unusual as he taxied the aircraft through the 180-degree turn to the left. When he applied right rudder pressure during the take-off roll, pedal response felt normal.

The investigation did not determine why the pilot was unable to maintain directional control during the take-off run. The snow condition may have contributed to the initial veer, but timely right rudder application should have corrected the situation. It is possible, therefore, that the correct take-off technique was not used.

FINDINGS:

Cause Related:

1. For undetermined reasons, the pilot was unable to maintain directional control on take-off.

Other:

-Nil-

* * * * *

KENORA DIAMOND DRILLING LTD.
CESSNA 180 C-FKOF
MIMINISKA LAKE, ONTARIO 5 mi SE
31 JANUARY 1985

REPORT NUMBER: 85-C50007 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1100 EST
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,000	3,000
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was cruising at low level on a visual flight, when the engine (Continental 0-470-L) suddenly lost power. The pilot force-landed the aircraft in a rough, sparsely treed clearing.

The engine was apparently operating normally prior to the stoppage, and, following salvage, the engine operated satisfactorily during testing. The temperature at the time was between minus 30 and minus 40 degrees Celsius. It is possible that there was a fuel blockage somewhere in the fuel system caused by ice; however, the reason for the loss of power was not determined. On landing, the aircraft was damaged when it came into contact with the trees and rough terrain.

FINDINGS:

Cause Related:

1. The engine lost power for undetermined reasons.

2. The aircraft sustained damage when it was landed in a rough, sparsely treed area.

Other:

-Nil-

* * * * *

PIPER PA-18-150 C-GIYJ
HAINES JUNCTION, YUKON 25 mi N
04 MAY 1985

REPORT NUMBER: 85-W50016 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1430 PDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,500	4,400
LAST 90 DAYS	49	49

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot used the ski-equipped aircraft to fly supplies into his hunting camp and regularly landed on the 1,000-foot-long ice surface of a creek bed. On this day, however, he landed long, and the aircraft ran off the end of the ice surface. Before coming to a stop, the aircraft struck some small spruce trees.

Because of rising terrain and a mountain to the southeast, the ice strip could be approached from one direction only. As well, these obstructions prevented the aircraft from overshooting in the event of a baulked landing. Consequently, when the pilot realized that he would not be able to stop on the ice surface, he could not initiate an overshoot.

Although he regularly used the ice strip, the pilot had not installed a wind direction indicator. On the day of the accident, there was a strong tail wind which the pilot did not recognize until after he was committed to land. A weather briefing was not available for this remote location.

The investigation concluded that because of the strong tail wind, the aircraft could not be stopped safely on the ice strip.

FINDINGS:

Cause Related:
1. The aircraft could not be stopped on the ice strip because of the strong tail wind and was damaged when it overran the landing area.

Other:
1. Because of terrain obstuctions, the ice strip could be approached from one direction only.

2. The rising terrain and the mountain prevented the aircraft from overshooting in the event of a baulked landing.

3. The pilot had not installed a wind direction indicator.

* * * * *

CESSNA 180K N63071
SEAL COVE, BRITISH COLUMBIA
8 JUNE 1985

REPORT NUMBER: 85-P50904 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1900 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial (USA)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	280	145
LAST 90 DAYS	76	51

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	3

SUMMARY REPORT:

Following initial touchdown on the water, the float-equipped Cessna aircraft bounced into a nose-high, left-wing-low attitude. The pilot lowered the aircraft nose and levelled the wings. Obstacles, which included a surface vessel and pilings, were ahead of the aircraft and prevented the pilot from initiating a go-around. He then reduced engine power to idle and allowed the Cessna to touch down for a second time. The pilot was unable to stop the aircraft from striking the rocky shore.

The length of the area that the pilot chose for landing is in excess of 9,000 feet and is oriented in a north-south direction. The pilot touched down long with insufficient distance ahead of him to either stop the aircraft in time after the first bounce or to carry out a go-around.

FINDINGS:

Cause Related:
1. The pilot touched down long with insufficient distance ahead to either stop the aircraft or to carry out a go-around.

Other:
-Nil-

* * * * *

PIPER J-3 C-FLOF
SNOWSHOE LAKE, MANITOBA 4 mi S
19 JUNE 1985

REPORT NUMBER: 85-C50041 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1745 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	142	100
LAST 90 DAYS	20	20

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The pilot commenced the take-off from a lake in a northerly direction parallel to the shoreline. The wind was from the northwest at 10 miles per hour with occasional gusts. Just after lift-off, as the aircraft passed abeam a point of land and an opening to a bay, the pilot encountered difficulty controlling the aircraft and decided to reject the take-off. As he closed the throttle, the right float struck the water with a sideways motion. Although the float structure was damaged, the fuselage remained upright with the right wing in the water. The aircraft eventually grounded near the shoreline. The pilot and his passenger took the emergency locator transmitter (ELT) and other survival equipment and swam to shore. Once ashore, the pilot turned on the ELT, and a Search and Rescue aircraft was able to locate the site before nightfall.

The sudden windshift as the pilot passed abeam the point of land and the opening to the bay and its effect on the aircraft caught the pilot unprepared. He reported that the aircraft was in a nose-high attitude, that the airspeed was decreasing and that there was a feeling of an imminent stall. Because of these factors, the pilot decided to reject the take-off attempt. The pilot was unable to prevent the aircraft from striking the water with a sideways motion.

FINDINGS:

Cause Related:

1. The pilot elected to reject the take-off when the aircraft became difficult to control after a sudden wind change.

2. The aircraft struck the water with a sideways motion, damaging the right float structure.

Other:
-Nil-

* * * * *

PIPER J3C-65 C-GYGZ
WAPIKAIMASKI LAKE, ONTARIO
19 JUNE 1985

REPORT NUMBER: 85-C50042 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1618 CDT
OPERATION: Private Company Business
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	290	140
LAST 90 DAYS	80	80

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had been engaged in a series of landings and take-offs, in and out of neighbouring lakes, since early morning. After taking off, in narrow confines between an island and the shoreline, the pilot initiated a climbing left turn. While in the climb, the aircraft rolled left, then descended in a near vertical attitude into the trees. The aircraft overturned and came to rest on the rocky shoreline.

Winds in the area were reported to be gusting and variable in direction. Examination of the wreckage revealed that all flight control systems were intact and operable. No mechanical or operational discrepancies were reported, nor was the centre of gravity or load a factor in this accident.

Gusty conditions and wind shear could have resulted in a reduced airspeed, causing the aircraft to stall. Because of the low altitude, the pilot was unable to regain control of the aircraft.

FINDINGS:

Cause Related:
1. The aircraft stalled at a low altitude in a climbing turn.

Other:
1. The take-off run and climb were attempted in an area of turbulence, wind shift, and wind shear.

* * * * *

CESSNA 185F C-GHPI
VANCOUVER HARBOUR SEAPLANE BASE, BRITISH COLUMBIA
23 JUNE 1985

REPORT NUMBER: 85-P50018 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1625 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	165	36
LAST 90 DAYS	18	18

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot and two passengers were returning to the Vancouver Seaplane Base in the float-equipped aircraft. Prior to landing, the pilot was cautioned by the tower that numerous large pleasure boats were causing large swells in the landing area. The pilot attempted to land parallel to the swells. On touchdown, the aircraft porpoised three times then nosed over into the water. The pilot and both passengers safely evacuated the aircraft.

The investigation revealed that, on touchdown, the aircraft landed across a large swell, which caused the aircraft to porpoise. The pilot continued the landing and he lost control of the aircraft. The tip of a float dug into the water, causing the aircraft to nose over.

The aircraft was not equipped with a suitable restraint device for the three-year-old passenger, and he was held in the other passenger's lap. As well, none of the aircraft occupants donned the flotation devices carried on board the aircraft.

FINDINGS:

Cause Related:
1. The aircraft landed across a large swell which initiated a porpoising sequence.

2. The pilot lost control of the aircraft while attempting to continue the landing.

Other:
1. The three-year-old passenger was held in a passenger's lap.

2. None of the aircraft occupants donned the flotation devices carried on board the aircraft.

* * * * *

CESSNA A185F C-GQDP
RAINBOW LAKE, BRITISH COLUMBIA
30 JUNE 1985

REPORT NUMBER: 85-P50020 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1515 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	959	443
LAST 90 DAYS	22	19

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

During a take-off attempt from the surface of a lake, the pilot was unable to maintain directional control, and he rejected the take-off at 40 knots indicated airspeed. As he decreased the power, the aircraft veered hard right, and the left wing dug into the water. The aircraft then pivoted to the left, and the other wing dug into the water.

The wind and weather were reported as being favourable, and the lake was calm. The pilot stated that this particular aircraft required a lot of right rudder on take-off, and, to his knowledge, an attempt to correct the problem had never been undertaken. When the pilot retarded the throttle to reject the take-off, he still had full right rudder applied, and this caused the abrupt turn to the right.

FINDINGS:

Cause Related:

1. The pilot lost directional control during take-off.

Other:

-Nil-

* * * * *

CESSNA 180K C-GLSJ

NIMPO LAKE, BRITISH COLUMBIA
03 JULY 1985

REPORT NUMBER: 85-P50024 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1245 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	125	50
LAST 90 DAYS	55	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW			1
PASSENGERS			1

SUMMARY REPORT:

The pilot had broadcast his intentions and was circling Nimpo Lake in preparation for a landing, when he saw another aircraft taxiing on the water. Expecting the aircraft on the water to take-off, the pilot set himself up for an approach which would place him behind the departing aircraft. The pilot was turning onto final approach, with 20 degrees of flap selected, when he noticed that the aircraft on the water had stopped. He adjusted his final approach path to pass about 100 feet in front of the stationary aircraft. When the aircraft was about 20 feet above the water, the other aircraft started to taxi across the landing path. The pilot of C-GLSJ altered his heading to the right and landed but was unable to stop the aircraft before it struck the shore.

The pilot was not in radio communication with the aircraft taxiing on the water, and he was unaware of the other pilot's intentions. Just before touchdown, the pilot altered his heading to avoid the taxiing aircraft. As a result of the change in heading, there was insufficient area remaining to safely stop the aircraft. During the landing roll, the pilot did not retract the flaps. Had he done so, the aircraft may have settled into the water and stopped before reaching the shore.

FINDINGS:

Cause Related:

1. The pilot continued his approach for landing after another aircraft had entered his intended landing area.

2. The pilot did not raise the flaps after landing, and, as a result, the aircraft's landing roll distance was increased.

Other:

-Nil-

* * * * *

CESSNA 180F C-FYHS

ANAHIM LAKE, BRITISH COLUMBIA 20 mi N
03 JULY 1985

REPORT NUMBER: 85-P50022 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2040 PDT
OPERATION: Private Other
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,500	500
LAST 90 DAYS	30	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW		1	
PASSENGERS	1	1	

SUMMARY REPORT:

The pilot of the float-equipped aircraft, with a fire warden and one other passenger on board, was conducting an aerial forest fire spotting flight. After circling a fire, he turned up a sloping mountain valley to turn around for another pass over the fire. The valley was narrow, and the pilot was unable to turn the aircraft. The pilot initiated a climb; however, the aircraft contacted trees on the upward slope of the valley and nosed over 400 feet below the top of the valley and just beyond a clearing in the trees. The fire warden was killed, and the pilot and one passenger were seriously injured. The plane's ELT signals were picked up, the wreckage was spotted, and the injured were airlifted to hospital.

Under the existing conditions of temperature and altitude, the aircraft could not safely turn around in or climb out of the confined mountain valley.

The aircraft was not equipped with shoulder harnesses, nor were they required; however, medical evidence indicates that the injuries suffered resulted from unrestrained flailing of the occupants' upper bodies.

The pilot had misjudged both the turning space available in the mountain valley and the aircraft's climb capability. Once the aircraft was in the valley, ground contact could not be avoided. The aircraft could have been force-landed in a nearby clearing, likely with less serious consequences.

The occupants' injuries would have been less serious had the shoulder harnesses been available and worn.

FINDINGS:

Cause Related:

1. The pilot misjudged the turning space available and the aircraft's climb capability.

2. A more suitable forced-landing area was not used.

3. The occupants' injuries would have been minimized had shoulder harnesses been available and used.

Other:
-Nil-

* * * * *

TAYLORCRAFT BC-12D-85 CF-EBC
SANDY POINT ISLAND, ONTARIO
06 JULY 1985

REPORT NUMBER: 85-C50052 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1730 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	170	125
LAST 90 DAYS	4	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	2	-

SUMMARY REPORT:

The pilot of the float-equipped aircraft departed Rocky Inlet for Sandy Point Island, on Rainy Lake. Upon reaching the island, the pilot circled overhead to assess wind and water conditions and then made an approach to land parallel to the beach, on a southeasterly heading. However, he rejected this approach because a houseboat had moved into the landing area. After overshooting, he turned east and climbed to about 100 feet above ground level, then started a steep left climbing turn to the north. During the turn, the aircraft suddenly rolled further left and descended into a stand of large trees 200 yards from the shoreline. The two passengers were seriously injured.

The pilot stated that he was not monitoring the airspeed or the attitude, because he was concentrating on the houseboat's movements. He stated that the aircraft stalled, and, because of his altitude, he could not effect a recovery.

FINDINGS:

Cause Related:

1. The pilot was not monitoring the airspeed or attitude and stalled the aircraft during a steep turn.

2. The pilot could not effect a recovery because of the low altitude.

Other:
-Nil-

* * * * *

ROYAL CANADIAN MOUNTED POLICE
DE HAVILLAND DHC-2 C-FMPR
SEPT-ILES, QUEBEC 40 mi N
30 AUGUST 1984

REPORT NUMBER: 84-Q40065 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1710 EST
OPERATION: State
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	700
LAST 90 DAYS	50	50

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The float-equipped aircraft departed Squaw Lake, Quebec on a visual flight rules (VFR) flight to Sept-Iles, Quebec. On passing Wabush, Quebec, the pilot encountered lowering ceilings and reduced visibility in fog. To remain VFR, the pilot descended below the level of the tops of the hills in the area and navigated by following the lakes along his route. Forty miles north of Sept-Iles, the aircraft struck trees on rising terrain and came to rest in a wooded area.

The pilot had checked the weather prior to flight. The Sept-Iles weather was below VFR minima but was forecast to improve to marginal VFR by the time of arrival. Due to an approaching cold front, the airmass in the region was unstable, and ceilings throughout the region were forecast to be as low as 500 feet above ground and as low as ground level over higher terrain. Visibility was forecast to be as low as one mile in thunderstorms. At Wabush, the pilot received a weather update for Sept-Iles, which indicated that the weather conditions there were improving.

The forecast weather conditions for the area were such that the pilot could have expected to encounter below VFR weather en route. Once the pilot did encounter such conditions, he continued with the flight to the point where he was required to fly at a very low altitude to remain VFR. The pilot was unable to see the rising terrain ahead because of the poor visibility, and the aircraft struck the trees.

When deteriorating weather was encountered en route, the pilot could have turned back and landed at a suitable VFR location or he could have initiated a climb and airfiled an IFR flight plan.

FINDINGS:

Cause Related:

1. The pilot elected to continue the VFR flight into below VFR weather conditions.

2. When the pilot attempted to remain VFR in the deteriorating weather conditions by flying at low altitude, the aircraft struck trees on rising ground.

Other:

-Nil-

* * * * *

GOVERNMENT OF CANADA
DEPARTMENT OF TRANSPORT
DOUGLAS DC 3 C-FDOT
GANDER, NEWFOUNDLAND 75 mi W
23 JANUARY 1985

REPORT NUMBER: 85-A54006(Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1900 NST
OPERATION: State
DAMAGE: None
PILOT LICENCE: Airline Transport

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	10,700	1,300
LAST 90 DAYS	60	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	3
PASSENGERS	-	-	7

SUMMARY REPORT:

The aircraft was cruising at 6,000 feet, when the crew observed sparks coming from the cowl area of the right engine. The right engine rpm dropped, and the engine began to vibrate. The engine was shut down, and the aircraft returned to the point of departure without further incident.

The number one cylinder on the right engine had failed around the circumference where the cylinder meets the cylinder head.

Pre-cracking, which was evident in the failure area, had weakened the cylinder to the point where it failed. The cause of the pre-cracking was not determined.

FINDINGS:

Cause Related:

1. The cylinder failed as a result of pre-cracking of undetermined origin.

Other:

-Nil-

* * * * *

DEPARTMENT OF TRANSPORT
LOCKHEED L-1329 C-FDTX
WINNIPEG INTERNATIONAL AIRPORT, MANITOBA
30 MAY 1985

REPORT NUMBER: 85-C54011 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1735 CDT
OPERATION: State
DAMAGE: Minor
PILOT LICENCE: Airline Transport

PILOT HOURS:	PILOT-IN-COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	20,000	5,000	15,000	2,000
LAST 90 DAYS	30	30	100	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	4
PASSENGERS	-	-	5

HISTORY OF THE FLIGHT:

The aircraft was taxiing to the ramp for a planned technical stop at Winnipeg International Airport, when the number two engine's exhaust gas temperature (EGT) suddenly increased beyond the maximum permitted. The crew shut down the engine (Pratt & Whitney JT 12-6A) and completed the taxi to the ramp without further incident.

PERTINENT INFORMATION:

Debris, which was identified as turbine blades from the number two engine, was found on the runway and taxiway. This debris and the engine were shipped to the engine manufacturer. The subsequent examination determined that the turbine's first stage nozzle guide vanes moved aft and contacted the first stage turbine.

A clearance tolerance is applied when the engine is inspected or overhauled. When the clearance is beyond the tolerance or if deterioration is detected, the vanes are replaced. The engine had been operated for 1,982 hours since its last overhaul; the time between overhaul is 3,000 hours, and the hot end is inspected at 1,100 and 2,200 hours and is removed with the engine at 3,000 hours with no extension.

ANALYSIS:

Movement of the first stage nozzle guide was attributed to deterioration of the guide vanes as a result of excessive wear.

As a result, the turbine failed, which caused the EGT to rise suddenly. As the engine had been operated for 1,982 hours since last overhaul, it was determined that the deterioration had occurred after that overhaul. The cause of the excessive wear could not be determined.

FINDINGS:

Cause Related:

1. The first stage nozzle guide vanes had deteriorated because of excessive wear; the cause of the wear could not be determined.

2. The excessive wear resulted in movement of the guide vane aft and subsequent failure of the turbine.

Other:
- Nil -

* * *

POINT DU JOUR AVIATION
HUGHES 269B (Helicopter) C-FVKJ
MASCOUCHE, QUEBEC
2O DECEMBER 1983

REPORT NUMBER: 83-Q30083 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1610 EST
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	600	502
LAST 90 DAYS	.2	.2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

After completing a test flight in the aircraft, the pilot landed the aircraft and reduced the power to 2,000 rpm. Shortly afterwards, a loud whistling sound was heard; three seconds later, the main rotor suddenly stopped. The helicopter pivoted 90 degrees to the left but remained upright. The main rotor gearbox had seized.

the ring cavity between the front and back bearings were almost completely blocked by contaminants. A substantial proportion of these contaminants was identified as a sealing compound of the type used during installation of the oil pump.

The following laboratory reports were completed:
LP 456/83 - Examination of Main Rotor Gearbox;
LP 21/84 - Assessment of Bearing Failure in Flight;
and LP 22/84 - Fuel Analysis.

FINDINGS:

Cause Related:

1. The seizing of the main rotor gearbox was caused by seizing of the input pinion shaft back bearing.

2. The back bearing seized because of inadequate lubrication.

3. Oil circulation in the back bearing was reduced because of an accumulation of contaminants in the grease fittings.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

HORIZON HELICOPTERS LTD.
BELL 206B (Helicopter) C-GTWP
MOUNT HENTIG, BRITISH COLUMBIA
12 MAY 1984

REPORT NUMBER: 84-P40016 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1500 PDT
OPERATION: Specialty Aerial Application and Distribution
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	380	110
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot and two forestry personnel took off to conduct range burning in the Mount Hentig area. After about 40 minutes of flight, it became necessary to land to perform some work on the aerial ignition device. The top of Mount Hentig was selected as the landing site as it had a gently rounded top, clear of trees. The pilot flew a steep downwind approach on a westerly heading at a speed of 10 to 15 knots to about 20 feet above ground level, at which time he decided to reject the approach. When power was applied, the helicopter began a rotation to the right which the pilot could not overcome with application of left tail rotor pedal. It spun right a couple of turns while climbing then started to spiral down the mountainside until it contacted the ground and came to rest upright, 150 feet east of and 130 feet below the top of the mountain.

There were scattered clouds in the area with an easterly wind at 10 to 15 knots and a temperature of 10 degrees Celsius. The crash site was 4,900 feet above sea level, and the helicopter weight was within 200 pounds of the maximum weight for hovering out of ground effect at that altitude. The investigation did not reveal any pre-crash malfunction or failure.

The flight was made despite verbal instructions that forbade the pilot from flying during the absence of his supervisors. The pilot was hired as an engineer with the understanding that he would obtain some flying hours. He had no previous experience or training in this type of mountain flying.

The tail wind component combined with the effects of the power increase, heavy weight, high density altitude, and low forward airspeed created a condition where the anti-torque requirements exceeded the authority of the tail rotor, which resulted in an uncommanded right turn. In conditions such as those encountered by the pilot, it is essential that the possibility of an uncommanded turn be anticipated. Under these conditions, the uncommanded right turn could only have been arrested by a power reduction and immediate increase of airspeed. At the point in the descent where the pilot attempted to reject the approach, he no longer had either option available.

FINDINGS:

Cause Related:

1. The pilot, without adequate experience and training attempted a manoeuvre in mountainous terrain which resulted in an uncommanded right turn.

2. The uncommanded right turn led to uncontrolled flight when appropriate and timely recovery procedures were not initiated.

Other:

1. The flight was not authorized by the operator.

✈ ✈ ✈ ✈ ✈

OKANAGAN HELICOPTERS LTD.
BELL 206B (Helicopter) CF-OAJ
LASCA CREEK, BRITISH COLUMBIA
19 JULY 1984

REPORT NUMBER: 84-P40033(Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1700 PDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,472	5,076
LAST 90 DAYS	220	220

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	3

SUMMARY REPORT:

The pilot and three passengers took off from a claim site, nine miles east of Nelson, British Columbia, en route to Nelson.

Shortly after take-off, and while the helicopter was cruising at about 7,000 feet above sea level (asl), the engine (Allison 250 - C20) lost all power. The pilot carried out a 360-degree circling autorotation to land in a relatively clear area directly below. The helicopter was approaching the selected landing site and was above a stand of trees 80 to 100 feet high, when the rate of descent increased. To clear the trees, the pilot had to increase collective; however, the increased collective caused a decrease in rotor rpm to the extent that a normal autorotative flare and landing could not be made, and the helicopter landed hard, tail first. The main rotor blades chopped off the rear of the tail boom, the skids broke, and the helicopter rolled onto its left side. The pilot was seriously injured.

The landing site was on a mountain slope 6,200 feet asl. The loss of power was caused by the failure of the engine driven fuel pump. The splines on the drive shaft and the mating pump spur gear bore were worn to the extent that the shaft rotated without driving the pump. Although maintenance records indicated that the pump and drive mechanism had been inspected and lubricated 150 airframe hours before the failure, there was no evidence of lubrication. There was a requirement in the aircraft maintenance manual that the pump be inspected and lubricated at least every 600 hours.

FINDINGS:

Cause Related:

1. The fuel pump drive assembly failed, and there was no evidence of lubrication.

2. The reason for the lack of lubrication could not be determined.

3. To clear trees during the forced landing, collective was increased, resulting in a decrease in rotor to the extent that a normal autorotative landing was not possible, and a hard landing ensued.

Other:
-Nil-

* * * * *

NORTHERN MOUNTAIN HELICOPTERS INC.
BELL 206B JET RANGER (Helicopter) C-FNMP
QUESNEL, BRITISH COLUMBIA 35 mi SE
26 JULY 1984

REPORT NUMBER: 84-P40037(Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1330 PDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	6,385	2,220
LAST 90 DAYS	15	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	1

SUMMARY REPORT:

At approximately 1300 Pacific daylight time (PDT), the pilot and one passenger took off from Quesnel, British Columbia to deliver a cargo of 528 pounds to a drilling site 35 miles to the southeast. After locating the site and the landing area, the pilot established himself on the downwind leg at 150 to 200 feet above ground level and at a speed of 20 to 30 mph. He turned right cross-wind to establish the final approach into wind; however, as the helicopter came into wind it continued an uncommanded turn to the right and started to descend. The pilot applied full left pedal and forward cyclic. The power was then increased, but the turn continued. The lowering of the collective also had no effect, and the helicopter continued turning to the right for a total of three 360-degree turns. Just prior to impact, the pilot pulled the cyclic fully back, and the helicopter crashed tail first into a treed area. The helicopter came to rest at an elevation of 3,400 feet in a near vertical position with the nose down and the tail boom broken in half. The pilot was seriously injured.

The weather was good with the wind from the east-southeast estimated at 20 to 25 knots with gusts and some turbulence, and a temperature of 22 to 26 degrees Celsius. The investigation did not reveal any pre-crash malfunction or failure.

The right turn toward final approach was conducted at low speed which, when combined with the high aircraft weight and high density altitude, resulted in a condition where anti-torque requirements exceeded the authority of the tail rotor. The application of full left pedal was in accordance with normal recovery procedures; however, the increase in power would have aggravated the right turn. Once the turn was fully developed, insufficient altitude remained for the application of forward cyclic and down collective to effect recovery.

FINDINGS:

Cause Related:

1. The right turn toward final approach was conducted at a high density altitude and at a low speed which resulted in a condition where anti-torque requirements exceeded the authority of the tail rotor.

2. The application of power to effect turn recovery aggravated the right turn.

3. Insufficient altitude remained for the forward cyclic and down collective to effect recovery prior to ground impact.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

ASSOCIATED HELICOPTERS LTD.
BELL 47J-2 (Helicopter) C-FOGA
PEDLEY, ALBERTA
01 AUGUST 1984

REPORT NUMBER: 84-W40051(Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1105 MDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	18,561	14,273
LAST 90 DAYS	125	125

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter, which was on a pipeline patrol, was cruising at 60 knots, approximately 200 feet above ground level, when the engine (Lycoming TVO-435) lost all power. The pilot made an autorotative landing on a railroad right-of-way, and the aircraft landed heavily on sloping terrain. The main rotor blade severed the tail boom and struck the railroad embankment.

The helicopter was equipped with a shoulder harness in the pilot position, but the harness was not being used by the pilot at the time of the accident. Neither crew member was wearing any head protection. The pilot suffered severe head injuries, and the crewman suffered minor injuries.

The investigation determined that the loss of engine power was due to fuel exhaustion. Prior to the flight, the helicopter was not refuelled. A change of routine after the previous flight had led both crew members to believe that the other was responsible for refuelling, and neither one checked the fuel on the morning of the accident flight. As well, neither crew member recalled looking at the fuel gauge prior to or during the flight; the gauge was determined to be serviceable.

The helicopter was being operated at a speed and altitude that should have allowed a safe autorotative landing; however, it landed heavily enough to cause severe rotor blade flexing and structural damage.

FINDINGS:

Cause Related:

1. The engine lost all power because of fuel exhaustion; the aircraft had not been fuelled prior to the flight.

2. Neither the pilot nor the crewman confirmed that the aircraft had been fuelled.

3. The fuel quantity gauge was not monitored during flight.

4. The aircraft was damaged during the autorotative landing.

5. Neither occupant was wearing a shoulder harness or head protection; the pilot suffered severe head injuries.

Other:
-Nil-

* * * * *

AERO ARCTIC LTD.
SIKORSKY S-55T (Helicopter) C-FAAQ
YELLOWKNIFE, NORTHWEST TERRITORIES
6 AUGUST 1984

REPORT NUMBER:84-W40057 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1315 MDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	15,000	5,000
LAST 90 DAYS	100	100

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

HISTORY OF THE FLIGHT:

The pilot of a Sikorsky S-55T was long lining a drill from the Yellowknife Airport to a remote hydro site. As the load was lifted clear of the truck, the pilot heard the rotor speed decreasing. The pilot lowered the collective, but the rotor rpm continued to decrease. An autorotative landing was attempted from 60 feet, but the helicopter landed hard, collapsing the landing gear and crushing the lower fuselage. The engine (Garrett TSE-331-3U-303N) continued to run at ground idle, so the pilot shut it off and applied the rotor brake to stop the blades.

PERTINENT INFORMATION:

The engine was removed and examined at the manufacturer's facility. It was determined that a metal chip had restricted the fuel enrichment orificed union and that the overspeed governor adjustment on the fuel control unit was limiting the maximum fuel flow below the manufacturer's specifications. During the early developmental period of the conversion of the Sikorsky S-55 piston engine to the fixed shaft Garrett turbine engine, problems were encountered with "spool down" (turbine speed deceleration under maximum load). To overcome this problem, the manufacturer introduced a modification known as the "fuel enrichment system" that would add additional fuel under high demand situations.

ANALYSIS:

Laboratory examination of the restricted fuel enrichment orificed union determined that metal displaced by broaching had not been cleared at the completion of the machining operation, causing a fuel flow restriction.

The metal chip found in the fuel enrichment orificed union reduced fuel flow to 11 pounds per hour rather than the 40 pounds per hour required by the specification. Also, the adjustment on the overspeed governor had been set at 60 pounds per hour instead of the 220 pounds per hour required. This combination resulted in the engine decelerating when subjected to a maximum load.

Reference to the airframe manufacturer's "limiting height/velocity diagram" for the S-55T indicates that an autorotative landing while hovering at 60 feet above ground level would not be possible without damage to the helicopter.

The following laboratory report was completed:
LP 316/84 - Fuel Enrichment Orificed Union.

FINDINGS:

Cause Related:

1. A metal chip restricted fuel flow in the fuel enrichment system orificed union causing the engine to lose power.

2. Metal displaced by broaching of the orificed union had not been cleared at the completion of the machining operation.

3. The fuel control overspeed governor was adjusted so that the maximum fuel flow was not available.

4. The loss of engine power resulted in a hard autorotative landing causing substantial damage.

Other:
-Nil-

* * * * *

AERO TRADES (WESTERN) LTD.
BELL 206B (Helicopter) C-GCXM
CRANBERRY PORTAGE, MANITOBA
20 AUGUST 1984

REPORT NUMBER: 84-C40070 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1720 CDT
OPERATION: Commercial Non-Revenue
DAMAGE: Destroyed
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,742	1,432
LAST 90 DAYS	227	227

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	3	-	-

SUMMARY REPORT:

The Bell 206B helicopter took off from the Department of Natural Resources (DNR) dock at Cranberry Portage on a local sightseeing flight with the pilot and three passengers on board. The helicopter proceeded west at very low altitude (just above the water) and returned minutes later at about tree-top level. Near the dock, the helicopter climbed to about 100 feet, made a couple of turns, and descended to low level again. The helicopter then climbed to about 300 feet and descended in a 45-to-60-degree dive. During the dive, the tail hit the water, the tail rotor severed the tail boom, and the vertical stabilizer and tail rotor assembly broke away. The helicopter climbed to 50 to 75 feet, commenced a descending right spin, and crashed into the water in a nose-down attitude. There was a short duration fire following impact, and the helicopter immediately sank in 15 feet of water. All occupants died due to injuries and burns received in the crash and immersion in water.

The weather was good with no cloud at flight altitudes; the wind was from the west, estimated at 14 to 25 knots, and the temperature was 22 degrees Celsius.

The cyclic and collective servos of the helicopter flight controls were determined to be serviceable. As far as could be determined, there was no mechanical malfunction prior to initial impact with the water.

The helicopter and pilot were contracted to DNR for the period 15 May to 31 August 1984 for the exclusive use of DNR. The passengers were visiting friends in Cranberry Portage and had asked the pilot, through the friends, if they could have a helicopter ride. The pilot had flown 122 hours in the 30 days preceding the accident.

The pilot performed some manoeuvres including a steep dive, from which he was unable to recover before the tail hit the water. Once the tail assembly broke off, control of the helicopter would have been virtually impossible, and an out-of-control crash was inevitable.

The following laboratory report was completed:
LP 290/84 - Caution Light Panel.

FINDINGS:

Cause Related:
1. The helicopter entered a dive and the pilot did not effect recovery before the tail hit the water.

2. The tail rotor and vertical stabilizer broke off when the tail hit the water during recovery from the steep dive.

3. Without the tail assembly, control of the helicopter was lost, and it crashed nose down into the water.

Other:
-Nil-

* * * * *

QUASAR HELICOPTERS
BELL 206L-1 (Helicopter) C-GSQH
LAKE HARBOUR, NORTHWEST TERRITORIES
02 SEPTEMBER 1984

REPORT NUMBER: 84-Q40064 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1600 EDT
OPERATION: Specialty Aerial Photography and Survey
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,328	430
LAST 90 DAYS	208	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

HISTORY OF THE FLIGHT:

The pilot and two passengers departed Cape Dorset, Northwest Territories on a visual flight rules (VFR) flight to Lake Harbour, Northwest Territories. As the helicopter neared Lake Harbour, the visibility reduced in fog, and the pilot, in order to remain visual, flew at an airspeed of 10 to 20 mph, 75 to 100 feet from the shoreline and 30 feet above the water. At this point, the pilot suddenly lost visual contact with the shore and lost all visual references. He was unable to maintain control of the helicopter, and it struck the water and rolled upside down. The pilot and passengers exited the helicopter and climbed onto the inverted wreck.

PERTINENT INFORMATION:

The two passengers were wearing immersion suits which contained flotation devices, and one of them was able to swim to shore and then pull the helicopter in close to shore. The pilot was not wearing an immersion suit and suffered from hypothermia and shock. The helicopter Narco 10 emergency locator transmitter (ELT) was rendered inoperative when it was immersed in the cold water. The survivors were rescued the following day by a local hunter. The pilot stated that he had not known about the existence of immersion suits before seeing his passengers' suits on this flight. The pilot was not wearing a life-vest; these were stored in the rear cabin section.

While en route to Lake Harbour, the pilot had been forced to land twice to wait for the visibility to improve, before he could proceed. Because of these unscheduled stops, the pilot contacted an overflying flight on very high frequency (VHF) radio and asked the crew to inform the Frobisher Bay Flight Service Station (FSS) of his delayed time of arrival at Lake Harbour. Although a high frequency (HF) radio was installed in the helicopter, this equipment was unserviceable at the time of the accident and had been so for some time prior to the accident.

The pilot checked the weather prior to departing Cape Dorset.

The regional forecast for the Foxe, Frobisher and Cumberland regions at the time of the accident called for frequent stratus ceilings at 200 to 600 feet above ground, with visibilities of zero to two miles in fog. The pilot's licence was restricted to day VFR only. His records indicated that he had very little instrument flying training.

The pilot had been on contract for 45 days prior to being hired for this, his first arctic assignment. He did not receive briefings from the hiring company on arctic operations or survival. He had been flying on this contract for 51 days at the time of the accident and had accumulated 208 hours of flying time in the past 90 days.

ANALYSIS:

The weather, which the pilot encountered en route, was essentially as had been forecast for the region. The forecast as well as the two forced stops en route indicated that the weather was marginal for VFR flight. When the pilot encountered fog near Lake Harbour, he lost visual reference with the shoreline, became disoriented, and lost control of the helicopter. The pilot may have been fatigued as a result of his demanding work schedule over the past three months, and this may have affected his judgement.

When flying in the Arctic, particularly along coastlines with open water, rapid changes in weather conditions occur. It is good practice to obtain marine as well as aviation weather forecast updates as the flight progresses. The pilot was unable to do so because of the unserviceable HF radio. This unserviceability also forced him to relay essential flight notification changes to the FSS through another aircraft.

FINDINGS:

Cause Related:

1. The pilot elected to continue the flight into weather conditions which were unsuitable for VFR flight.

2. When the pilot lost all visual references in the fog, he became disoriented and lost control of the aircraft, causing it to strike the water.

Other:

1. The pilot had been on continuous duty for more than 90 days.

2. An unserviceable HF radio prevented the pilot from obtaining weather report and forecast updates.

3. The pilot was not wearing adequate protective clothing.

4. The pilot had not received briefings on arctic operations or survival prior to commencing this assignment.

5. A life-vest was not readily accessible to the pilot.

6. The ELT installed on the aircraft was rendered inoperative when it was immersed in water.

SAFETY ACTION:

Action Taken:
The Canadian Aviation Safety Board conducted a study on the influence of flight crew fatigue on aviation safety and, in 1986, forwarded six recommendations to the Minister of Transport.
Transport Canada has now formed a study group to consider measures to assist in the prevention of fatigue-related occurrences.

✈ ✈ ✈ ✈ ✈

WRIGHT BROTHERS AVIATION
BELL 206B (Helicopter) C-GWRI
LAKE CITY HELIPORT, BURNABY, BRITISH COLUMBIA
18 SEPTEMBER 1984

REPORT NUMBER: 84-P44012 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1840 PDT
OPERATION: Charter
DAMAGE: None
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,000	1,600
LAST 90 DAYS	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The helicopter was parked to the side of a licensed heliport area on the roof of a building. The pilot was on board, and the engine was running at ground idle. The passenger exited the building door onto the roof and proceeded toward the helicopter. As the passenger went around the rear of the helicopter to reach the passenger door on the other side, he was struck on the buttocks by the tail rotor, and he suffered minor injury. The passenger was walking in a pronounced crouch when near the helicopter.

The helicopter was parked to the side of the landing area with the passenger door near the edge of the roof. The pilot had parked there because he had expected more traffic to land on the heliport prior to his departure. Because the destination heliport would soon be temporarily closed to air traffic, the pilot was in a hurry to get airborne; he had the engine running and the passenger door open so that there would be no delay in taking off. When the passenger moved toward the rear of the helicopter, the security guard yelled at him but was not heard. The pilot signalled for the passenger to go around the front of the helicopter, but his signals were misinterpreted. The passenger had not been briefed on the proper way to board this flight; he was not escorted on board, nor did he have time to read the posters pertaining to helicopter safety that were displayed near the helipad area.

The helicopter was parked such that there was little room between it and the edge of the roof. The passenger had previously flown in helicopters, but, when boarding them, he had usually been accompanied by the pilot.

FINDINGS:

Cause Related:
1. The passenger's safety was placed in jeopardy when he was required to board the helicopter away from the normal heliport loading/unloading area.

2. There was inadequate passenger control at the heliport.

Other:
-Nil-

SAFETY ACTION:

Action Taken:
The operator of this heliport will limit the use of the heliport to one helicopter at a time.

✈ ✈ ✈ ✈ ✈

TRANS-QUEBEC HELICOPTERS
BELL 206B (Helicopter) C-GUXB
ST. FAUSTIN, QUEBEC
8 OCTOBER 1984

REPORT NUMBER: 84-Q40081 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1515 EDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,000	1,800
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter pilot encountered deteriorating weather conditions on the final leg of a visual flight rules (VFR) ferry flight. As the visibility reduced, the pilot decreased the airspeed, while navigating with visual reference to a highway. The pilot saw a power line immediately ahead and attempted to fly under it, but the main rotor struck the bottom wires. The pilot force-landed on uneven ground beside the highway, and the helicopter rolled over onto its side.

The pilot had received a weather briefing prior to departure and was aware that the forecast for the en route weather was one mile visibility in drizzle and fog. The pilot was familiar with the area and knew the location of the power line.

Although the pilot was aware of the forecast weather conditions, he elected to continue with the VFR flight. He was aware of the location of the power line but believed that, because he had reduced his airspeed, he would see the power line in time to avoid it. However, the visibility was such that he was unable to detect and avoid the power line in time.

FINDINGS:

Cause Related:

1. The pilot continued the flight into deteriorating weather conditions that reduced flight visibility.

2. Because of the reduced visibility, the pilot did not see the power line in time to avoid it.

3. The aircraft was force-landed on uneven ground which caused it to roll over.

Other:
-Nil-

* * * * *

OKANAGAN HELICOPTERS
BELL 206B (Helicopter) C-GAHJ
WEDGEMONT LAKE, BRITISH COLUMBIA
07 DECEMBER 1984

REPORT NUMBER: 84-P40064 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1230 PST
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,000	1,400
LAST 90 DAYS	110	95

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	4

SUMMARY REPORT:

The pilot was on a charter flight to pick up four passengers who had been skiing on Wedge Glacier. As he approached Wedgemont Lake, he chose to land at the end of the lake near the glacier ice-fall, so that this feature could be used to provide a reference for the landing. Both the surface of the lake and the surrounding hills were covered with snow. The weather was good with occasional sunshine breaking through thin cloud cover; however, the landing and take-off area was in the shadow of the hills. The terrain was devoid of visual cues, and the terrain features were difficult to discern.

He boarded the passengers with their ski equipment, then manoeuvred the helicopter in a low hover towards the shore of the lake. The new area had few surface features that could have been used as a reference for take-off. The pilot started his take-off from a low hover, but, because of marginal visibility in whiteout and swirling snow, he rejected the take-off attempt before he had attained translation speed. As he was making tracks with the skids along this new take-off path in preparation for the next take-off position, he lost all visual reference because of the swirling snow and the white surface of the lake. He lowered the collective to land, and the skids struck the surface while the helicopter was drifting to the left. The left skid failed, and the main rotor blades flexed downward striking the surface of the lake. The blades were deflected, and they struck the upper part of the engine cowling and severed the tail boom. When the main rotor stopped turning, the pilot and passengers exited safely.

The preparations that the pilot had made for his take-off indicated that there were very few visual references that could be used to aid depth perception. This slow hover produced whiteout conditions, and, due to the absence of visual references in the whiteout conditions, the pilot attempted to land the helicopter, unaware that it was drifting.

FINDINGS:

Cause Related:

1. As the helicopter was hovering, the pilot lost visual reference, because of whiteout conditions produced by the downwash of the main rotor blades and attempted to land the helicopter.

2. During the attempted landing, as the helicopter was drifting to the left, the skids struck the surface of the lake, and the left skid collapsed.

3. The main rotor blades flexed downward, struck the engine cowling, and severed the tail boom.

Other:
-Nil-

* * * * *

TRANS-NORTH TURBO AIR LTD.
AEROSPATIALE SA316B ALOUETTE III
(Helicopter) C-GTNI
WHITEHORSE AIRPORT, YUKON
4 MAY 1985

REPORT NUMBER: 85-W54049 (Incident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1553 PDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	10,600	950
LAST 90 DAYS	100	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The helicopter was being test run for maintenance checks. After start-up, as the parking brake was released in order to taxi the helicopter away from the hangar, the nose of the helicopter swung sharply to the right. The pilot immediately applied left pedal; however, this aggravated the situation, and the helicopter rotated uncontrollably to the right. By the time the pilot had shut down the engine, the helicopter had completed several rotations with multiple ground strikes by the main rotor blades. Shrapnel from the main rotor blades was sent flying across the ramp, damaging several aircraft and one vehicle. The helicopter had recently undergone a 600-hour inspection during which the main rotor head, mast, and tail rotor hub were removed and sent out for overhaul. The overhaul contractor for the rotor components had not worked on this type for several years, and the reassembly was done without reference to the appropriate manuals. Two errors were made during reassembly of the overhauled components. The droop stop for one of the main rotor blades was incorrectly installed, and the tail rotor blade horn assembly was installed 180 degrees out of alignment. When the helicopter was reassembled by the operator, the incorrectly installed droop stop was noticed and corrected. The blade horn assembly was removed at this time to permit installation of the tail rotor blades; the engineer noted the alignment of the assembly as received from overhaul and reinstalled it in the same manner. Because the horn assembly was 180 degrees out of alignment, the tail rotor blades were installed 180 degrees out of alignment so they would rotate in the proper direction. The blades had to be forcibly installed whereas they normally can easily be slid into place. The installing engineer did not make reference to appropriate aircraft manuals during reassembly and installation. Discussions with the helicopter manufacturer revealed that the blade attachment holes in the blade horn assembly are not all the same size. One of the four bolt holes for each blade is slightly smaller to prevent the blades from being installed incorrectly. When the horn assembly is installed correctly, the blades slide easily over the bolts into position. When the horn assembly is installed 180 degrees out, the blades have to be forced into position. Prior to the maintenance run up, the installation and the aircraft were inspected by the flight engineer (installing engineer) and the pilot; however, they did not confirm correct tail rotor blade response to pedal input.

The difficulties encountered in installing the tail rotor blades should have raised suspicions in the engineer's mind about the entire tail rotor hub installation. As a result of the incorrectly installed blade horn assembly and blades, the tail rotor blade pitch movement was in the wrong direction for a given pedal control input. Consequently, when the helicopter initially swung right, the left pedal input by the pilot aggravated the situation. Because of the inaccessability of the parking brake handle, the pilot elected to shut the engine off rather than attempt to re-engage the parking brake. During the time required to shut the engine off, the main rotor blades struck the ground several times.

FINDINGS:

Cause Related:

1. The overhaul contractor reassembled the tail rotor hub with the tail rotor horn assembly 180 degrees out of alignment.

2. The operator installed the tail rotor blades 180 degrees out of alignment on the horn assembly, and, as a consequence of the misaligned horn assembly, the tail rotor blade pitch movement was in the wrong direction for a given pedal input.

3. Component reassembly at the overhaul contractors and component reassembly and installation at the operator's plant were carried out without reference to appropriate aircraft manuals.

4. During the pre-run-up inspections of the helicopter, the incorrect reassembly of the tail rotor components was not detected.

Other:

-Nil-

* * * * *

LONG BEACH HELICOPTERS LTD.
BELL 47 G3B1 (Helicopter) C-FRZI
PITT MEADOWS, BRITISH COLUMBIA 7 mi N
06 MAY 1985

REPORT NUMBER: 85-P50011 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1545 PDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	700	500
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was practising "quick-stop" manoeuvres, when the engine (Lycoming TVO-435-B1A) lost power. The pilot carried out a forced landing on a pasture. The helicopter landed hard, in a slight left-side-low, nose-down attitude and rolled over. The pilot was thrown forward and his head struck the mixture/carb heat console attached to the main instrument panel, and, as a result, he suffered a 10-centimetre laceration. The pilot did not have a shoulder harness available, and he was not wearing a helmet.

The pilot attempted to extend the autorotation to clear a ditch, and, in doing so, the main rotor lost too much energy, which resulted in a hard landing.

Examination of the engine and its related systems did not reveal why the engine lost power.

The availability and wearing of a shoulder harness and the wearing of a helmet would have prevented the injury.

The following laboratory report was completed:
LP 103/85 - Carburettor Mixture Compensator.

FINDINGS:

Cause Related:

1. The helicopter's engine lost power for undetermined reasons.

2. The pilot's attempt to extend the autorotation resulted in the loss of main rotor energy and a hard landing.

Other:

1. The availability and wearing of a shoulder harness and a helmet would have prevented the injury.

* * * * *

DOMINION PEGASUS HELICOPTERS
HUGHES 500D (Helicopter) C-GVXT
SANDY LAKE, ONTARIO
08 MAY 1985

REPORT NUMBER: 85-C50024 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1000 CDT
OPERATION: Charter
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,565	163
LAST 90 DAYS	75	26

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	2

SUMMARY REPORT:

The pilot landed the helicopter on the shore of a lake to allow two passengers to deplane. The selected area of the shoreline was inclined towards the water, and the pilot held the helicopter steady under power as the passengers deplaned. During this operation, the pilot felt the aircraft lurch backwards. He attempted to correct the movement with more cyclic and collective but lost control as the helicopter lifted. It spun to the right and crashed into shoreline trees.

A piece of baggage, a backpack, placed on the ground by a deplaned passenger had rolled down the incline and was hit by the tail rotor. The tail rotor drive shaft sheared, which resulted in loss of tail rotor authority. The pilot, not realizing the cause of the "lurch", attempted to restabilize the helicopter on the shoreline. Because of the loss of the tail rotor, the helicopter was uncontrollable once it became airborne.

FINDINGS:

Cause Related:

1. The sloping area used for landing necessitated the use of power to maintain a steady platform for deplaning.

2. A backpack placed on the ground came in contact with the tail rotor, which caused the tail rotor drive shaft to shear.

3. The pilot was unable to maintain control, and the helicopter crashed into trees on the shoreline.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

RANGERS HELICOPTER CANADA
HUGHES 369D (Helicopter) C-GBCW
ST-GEDEON DE BEAUCE, QUEBEC
25 MAY 1985

REPORT NUMBER: 85-Q50014 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0900 EDT
OPERATION: Special Aerial Survey
DAMAGE: Minor
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5,500	3,000
LAST 90 DAYS	60	60

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The helicopter, on contract to the Federal Ministry of Energy, Mines and Resources, departed St-Gidion on an Inertial Survey System (ISS) flight. After arriving at a check-point, the ISS operator selected a landing area. The pilot made two passes to find the marker. The wind was varying from the south to the west and gusting to 30 knots. The pilot attempted to land the helicopter, but, while in a hover at an altitude of two feet above the ground, the helicopter drifted east of the intended landing area, and the main rotor blades contacted some trees. The pilot landed the helicopter safely in another area located 35 feet away.

The elapsed time between readings of the survey instruments at different geographic locations is short and critical, that is, four minutes. If the time frame is exceeded, the leg must be reflown.

At the check-point, two sets of markers were visible on the ground. One was located near the bench mark and the other was approximately 35 feet away. The surrounding area is poorly prepared for helicopter operations and requires confined area techniques for landing.

The pilot had never seen this landing area and was following the indication given by the ISS equipment and the instructions from its operator. The operator directed the pilot to the area near the bench mark for landing. Section III, Performance Data for Hughes 369D owners states that controllability during downwind hovering, and sideward and rearward flight has been demonstrated to be adequate in winds up to 20 knots. While attempting to hover near the ground, the strong wind shifted direction, and, although the pilot used maximum control inputs, he was unable to stop the helicopter from drifting to the east, at which time the rotor blades contacted the trees.

The pilot attempted to land at an unfamiliar site and in a confined area where strong and gusty winds at the time exceeded the helicopter limits.

FINDINGS:

Cause Related:
1. The pilot attempted to land at a site in a confined area, where cross-wind conditions exceeded the helicopter limits.

Others:
1. The very short time of four minutes allotted for a landing at an unfamiliar and confined area added additional pressure on the pilot.

* * *

RANGER HELICOPTERS OF CANADA LTD
BELL 206L1, (Helicopter) C-GIZQ
WHITECOURT AIRPORT, ALBERTA 3 mi N
5 JUNE 1985

REPORT NUMBER: 85-W50025 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1010 MDT
OPERATION: Commercial Non-Revenue
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	620	620
LAST 90 DAYS	200	200

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

As the helicopter was climbing out from the departure airport, the engine (Allison 250-C28B) lost all power. The pilot carried out an autorotative landing while attempting, unsuccessfully, to restart the engine. On touchdown, the rotor blades severed the tail boom.

The landing area was a small clearing covered with grass about three feet high and surrounded by trees and swampy ground. A Robinson R22 helicopter landed in the same area shortly after the occurrence and picked up the downed pilot. The engine exhaust of the R22 started a grass fire; the R22 took off immediately and was undamaged. However, the fire spread to the Bell 206, and it was destroyed by the fire.

The investigation failed to reveal the cause of the power loss; all the usable evidence was destroyed in the fire. The aircraft was landed on the only suitable area, but the pilot had to use all available rotor energy to reach the spot. On landing, the lack of rotor energy and the difficulty in judging height above the ground because of the tall grass, resulted in a hard landing. As a result, the rotor blades flexed downward and severed the tail boom.

FINDINGS:

Cause Related:
1. The engine lost power for undetermined reasons.

2. The helicopter landed hard, and the rotor blades severed the tail boom.

Other:
1. The downed helicopter was destroyed by a fire when the grass was ignited by the rescue helicopter's exhaust.

* * *

QUASAR HELICOPTERS LTD.
BELL 214B (Helicopter) C-GVXC
BRAGG CREEK, ALBERTA 12 mi SW
05 JUNE 1985

REPORT NUMBER: 85-P50016 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1400 MST
OPERATION: Specialty Aerial Construction
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8,500	1,300
LAST 90 DAYS	120	110

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-		-

SUMMARY REPORT:

The pilot departed from base camp for a flight of about four miles to the seismic line where he was to move drilling equipment. A 100-foot long line complete with a hook assembly was attached to the helicopter. While in cruising flight about 1,000 feet above terrain, the pilot heard a "bang"; the helicopter pitched nose down and began to rotate to the right. The pilot entered autorotation initially, as he suspected a loss of anti-torque control. He was subsequently able to add power and fly the helicopter down to a road on the valley floor several miles further along. As he approached the landing area, he released the long line and carried out a run-on landing. After landing, the pilot found that both tail rotor blades were damaged and cable marks were visible on the tail boom and horizontal stabilizer.

The pilot reported an overcast condition at 8,000 feet with good visibility. Winds in the mountainous terrain were causing considerable turbulence.

To establish the flight characteristic of the long line, an identical helicopter was flown at 10-knot increments from 50 to 100 knots. The long line remained well clear of the tail rotor even at the highest speed. The only likely way to get the long line into the tail rotor would be to fly at a high airspeed combined with rapid descent. The flight from the camp to the work site involved climbing over a ridge then descending about 1,000 feet.

It is possible that the line came in contact with the tail rotor as a result of a rapid descent after crossing the ridge, the turbulence encountered, or a combination of the two.

FINDINGS:

Cause Related:
1. The long line came in contact with the tail rotor for undetermined reasons.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

VANCOUVER ISLAND HELICOPTERS
BELL 204B (Helicopter) C-GRVW
TALEOMEY RIVER, BRITISH COLUMBIA
04 JULY 1985

REPORT NUMBER: 85-P50023 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1040 PDT
OPERATION: Specialty Aerial Control
DAMAGE: Substantial
PILOT LICENCE: Commercial Rotorcraft

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4,280	470
LAST 90 DAYS	202	165

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the helicopter which was equipped with a "monsoon bucket" had been scooping water from a fast-flowing river for about three and one-half hours and was dropping it on a nearby forest fire. As the bucket was being filled, the current carried it under the helicopter and attempted to sweep the bucket downstream. In an attempt to hold the bucket against the current, the pilot applied power to the helicopter. The tail rotor struck the water, and the helicopter rotated violently into the water. During the crash, the pilot was thrown against the side of the cockpit. The helmet he was wearing was cracked from the force of the impact. The pilot's shoulder harness was not worn.

During previous operations, the pilot had been able to judge the speed of the current and had picked up the bucket just as it was full and passed beneath the helicopter. On this attempt, the bucket was swept out in front of the helicopter and began to pull on the hoist line.

Instead of moving ahead to keep the bucket perpendicular to the helicopter, the pilot attempted to lift the bucket. He felt a juddering in his controls, which he thought was caused by pulling the bucket across the rocks on the river bottom.

In actual fact, it was the tail rotor blades striking the water. When the tail rotor dug in and broke the tail rotor drive, the helicopter immediately rotated to the right and crashed.

The fact that the pilot's head struck the side of the cockpit with such force as to break his helmet indicates that he might have suffered serious injury without the protection of the helmet. The shoulder harness was not used because the pilot felt he would not be able to observe the slung load adequately.

FINDINGS:

Cause Related:

1. The pilot attempted to lift the bucket against a strong current with the helicopter not centered over the load and he allowed the tail rotor to strike the water.

Other:

1. The pilot might have suffered a severe head injury had he not been wearing a helmet.

2. The pilot's shoulder harness was not in use.

* * * * *

FANTASY ADVENTURE FLIGHT CENTER LIMITED
SKYSEEKER MK II (Ultralight) C-ICBR
OKANAGAN LAKE, BRITISH COLUMBIA
12 MARCH 1984

REPORT NUMBER: 84-P45003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1525 PST
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	300	.3
LAST 90 DAYS	Unknown	.3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	1	-	-

SUMMARY REPORT:

The pilot of the float-equipped ultralight was carrying out a water taxi test in order to evaluate the aircraft's handling characteristics with a passenger on board. During a taxi run, the aircraft bounced into the air, then struck a wave, damaging the floats. The pilot attempted to taxi to shore; however, the aircraft nosed over in the water. Both the pilot and the passenger started to swim to shore. When it became evident that the distance was too great, they turned back to the still-floating aircraft. The passenger drowned during the return swim to the aircraft. Neither the pilot nor the passenger was wearing a life-jacket.

Prior to the taxi tests, the aircraft owner had instructed the pilot not to fly the ultralight while carrying a passenger on board, because the aircraft's horizontal stabilizer had to be rerigged for flight with two occupants. This rerigging is required to provide greater nose-up forces in flight and to remove the pitch-down tendency caused by the more forward centre of gravity when two persons are carried. The nature of the float damage indicates that the aircraft struck the water in a nose-down attitude. The damage also corresponds to the attitude to be expected if flight was attempted with two persons on board while the horizontal stabilizer was still rigged to the single-occupant position. Life-jackets were not carried on board the aircraft.

FINDINGS:

Cause Related:

1. During a water taxi test, the pilot allowed the ultralight aircraft to become airborne with a passenger on board; the horizontal stabilizer was still rigged in the single-occupantposition.

2. The passenger drowned during his attempt to swim back to the aircraft; he was not wearing a life-jacket.

3. Life-jackets were not carried on board the aircraft.

Other:
- Nil -

* * * * *

EIPPER AIRCRAFT QUICKSILVER MX (Ultralight) C-IDAY
CLAREMONT, ONTARIO
25 MARCH 1984

REPORT NUMBER: 84-O45002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1100 EST
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	8	8
LAST 90 DAYS	8	8

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was practising circuits in a single-seat ultralight, while her instructor monitored the flight from the ground. On the first circuit, the aircraft was high on final, and the student decided to overshoot. On the second circuit, the aircraft was again high on final, and the student steepened the approach to the runway. During the round-out for landing, the nosewheel struck the ground. Power was applied, and the aircraft bounced back into the air. The pilot raised the nose, and the aircraft stalled and struck the ground nose first. The aircraft came to rest on the nose and leading edges of the wings. The pilot was wearing a crash helmet which may have helped to prevent more serious injuries. The pilot did not round out in time following the steep approach to the runway. During the bounced landing, the pilot used an incorrect bounce recovery technique and, as a result, stalled the aircraft.

FINDINGS:

Cause Related:

1. The pilot did not round out the aircraft in time to prevent the nosewheel from striking the ground.

2. The pilot used an incorrect bounce recovery technique and, as a result, stalled the aircraft.

Other:

1. The pilot was wearing a crash helmet which may have helped to prevent more serious injuries.

* * * * *

EIPPER MXL (Ultralight) NOT REGISTERED
TRAIL, BRITISH COLUMBIA 10 mi S
02 APRIL 1984

REPORT NUMBER: 84-P45901 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0820 PST
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5	2
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight pilot was on a pleasure flight from his home in Washington State. He decided to try a stall manoeuvre; he reduced power and pulled back on the elevator control until the aircraft stalled and the nose dropped. He eased the stick forward until he felt he had sufficient speed for recovery and then pulled back on the elevator control to level off. At this point, the nose of the ultralight dropped suddenly, and the aircraft entered a spin from which the pilot was unable to recover. The pilot deployed his parachute just prior to impact. A witness to the accident stated that the right wing of the aircraft folded up just prior to the spin.

Examination of the aircraft revealed that it had been assembled in a competent manner and that there were pre-impact overload failures of both the left and right wing spar tubes. The owner's manual for this model cautions that airspeed builds rapidly in a dive. The pilot stated that he did not know what the airspeed was when he pulled out of the recovery dive, but he did not feel that it was excessive, nor that the G forces were great. The aircraft failed structurally while in flight; however, the cause of the failure could not be determined.

FINDINGS:

Cause Related:

1. The ultralight failed structurally while in flight; however, the cause of the failure was undetermined.

Other:

1. The pilot's use of a parachute may have prevented serious injury.

* * * * *

SKYSEEKER MK II (Ultralight) C-IAFX STE ANNE DE MADAWASKA, NEW BRUNSWICK

19 MAY 1984

REPORT NUMBER: 84-A45001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1900 ADT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: None

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5	5
LAST 90 DAYS	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight pilot took off from a private airstrip on the first test flight of his recently built aircraft. When the pilot returned to land, the surface wind was 45 degrees from the left of the runway centre line, at 15 mph. The pilot flew four approaches in an attempt to land, but, in each case, the wind and turbulence created difficulties, and he was forced to overshoot. On the fifth attempt, close to touchdown, the aircraft rolled to the left; the left wing struck the ground, and the aircraft cartwheeled and crashed.

The 400-foot airstrip was oriented north-south and was constructed on the pilot's property. Take-off and landing directions were restricted because of an 8-per cent runway slope and high telephone wires at the north end of the strip; all take-offs had to be toward the south, and all landings to the north.

The pilot had been receiving dual ultralight flight training from a school near his home. He had not yet written his pre-solo exam and, therefore, had not qualified for his student pilot permit. Earlier in the day, he had called his instructor and had requested a dual trip in his new aircraft. The instructor had refused to fly on that day because of adverse winds and turbulence.

When the pilot returned to land, the strong winds and turbulence made the aircraft very difficult to control, particularly considering the pilot's level of experience. As a result,the pilot was unable to control the aircraft during the landing attempt, and the aircraft crashed.

The pilot placed himself in an extremely hazardous situation by conducting this flight. He was inexperienced and had not completed his flight training. He was flying a newly built untested aircraft from an airstrip which was unsuitable in terms of length and obstructions. Finally, he was flying in wind conditions which had been deemed unacceptable by his instructor.

FINDINGS:

Cause Related:

1. The pilot flew from an airstrip which was unsuitable for ultralight operations.

2. The pilot knowingly flew in wind conditions and turbulence which had been deemed as unacceptable by his instructor pilot.

3. The pilot was not fully trained nor qualified to conduct the flight.

Other:
-Nil-

* * * * *

ROTEC ENGINEERING INC RALLY 2B (Ultralight) C-IAKC SHAWNIGAN LAKE, BRITISH COLUMBIA 1/2 mi W

12 JUNE 1984

REPORT NUMBER: 84-P45004 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 2100 PDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	4	.2
LAST 90 DAYS	4	.2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGER:	-	-	-

SUMMARY REPORT:

The pilot was on his first solo flight and his first flight in this aircraft type. While the aircraft was on final approach, the pilot allowed the aircraft's speed to drop below the recommended approach speed. The left wing dropped, and the pilot corrected using right roll control. The aircraft stalled, struck the ground, and ground looped.

The aircraft employs spoilers for roll control. Such spoilers function by reducing lift on one wing, which causes the aircraft to roll. As the aircraft was flying near its stalling speed, the use of spoilers to correct the wing drop resulted in a loss of lift, which caused the aircraft to stall. Due to his weight, it was not possible for the pilot to receive dual training given the weight limitations of this ultralight aircraft. As this flight was the pilot's first in the aircraft type, he was not familiar with its handling characteristics.

FINDINGS:

Cause Related:
1. The aircraft stalled while on final approach because roll spoilers were used to correct a wing drop, when the aircraft was near the stalling speed.

2. The pilot was not familiar with the aircraft's handling characteristics.

Other:
1. Due to his weight and the weight limitations of the aircraft, the pilot did not receive dual training.

* * * * *

CORBEN-BABY ACE (Amateur-built) C-GRFP
CRESTON, BRITISH COLUMBIA 20 mi NE
07 JULY 1984

REPORT NUMBER: 84-P40027 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1100 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	2,500	267
LAST 90 DAYS	19	19

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot departed Porthill, Idaho on a visual flight rules (VFR) flight to Cranbrook, British Columbia. As the aircraft proceeded up Kid Creek Valley, the pilot made a 360-degree turn to gain altitude, then proceeded en route at 500 to 1,500 feet above ground level. As he continued up the valley he realized that the aircraft was not going to clear the ridge. He flew to the left side of the valley to have room to complete a 180-degree turn back down the valley. However, before he commenced the turn, he encountered a downdraft strong enough that he was unable to stop the aircraft's descent, although he was flying at best rate-of-climb speed (70 mph) with full power. The aircraft crashed on the steep side of the valley, and the pilot was seriously injured.

The weather was good with some cumulus cloud starting to form, and there was little or no turbulence; the temperature was about 25 degrees Celsius. The investigation revealed no pre-accident aircraft malfunctions or failures.

The pilot had flown this route a number of times by following power lines, and he felt confident that he would be able to clear the mountain ridge. However, the location of the accident indicates that the pilot may have inadvertently overflown a turn in the power lines, and thus his normal route, and flew into a narrow valley with rapidly rising terrain. Because of the steep slopes and the downdrafts, the pilot was not able to fly the aircraft out the valley.

FINDINGS:

Cause Related:
1. The pilot was flying at too low an altitude to clear a mountain ridge.

2. During the manoeuvre to turn back down the valley, a downdraft exceeding the aircraft's climb capability was encountered.

Other:
-Nil-

* * * * *

EIPPER QUICKSILVER MX II (Ultralight) C-IETR
SAANICH, BRITISH COLUMBIA
14 JULY 1984

REPORT NUMBER: 84-P45006 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	115	65
LAST 90 DAYS	35	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

During take-off for a short pleasure flight, the pilot noted that the ultralight's elevator control felt unusual. When the aircraft had reached a safe height, the pilot evaluated aircraft control and found that, when engine power was reduced, the aircraft pitched nose-up and nose-down uncontrollably. The pilot decided to return for a landing, and he initiated a shallow power-assisted approach to a long grass strip. As the aircraft was about to touchdown, it again started to pitch nose-up and nose-down. The aircraft struck the ground in a relatively level attitude and then nosed over.

The pilot stated that, although he had checked most of the fastenings on the aircraft prior to the flight, he could not recall if he had checked that the wires to the horizontal stabilizer from the king post were tight. He thought that one or more of these wires had become slack and that this slackness had caused the uncontrollable pitch changes when the power was reduced. The investigators were unable to confirm this conclusion, as the aircraft had been dismantled prior to their arrival.

FINDINGS:

Cause Related:

1. For undetermined reasons, the aircraft pitched nose-up and nose-down uncontrollably when power was reduced.

Other:

1. The aircraft was dismantled prior to the arrival of the investigators.

* * * * *

BIRDMAN ATLAS 2 AXIS (Ultralight) C-ICBF
DEVON, ALBERTA 5 mi W
24 JULY 1984

REPORT NUMBER: 84-W45007 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2200 MDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	Unknown	200
LAST 90 DAYS	Unknown	Unknown

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight's owner had just completed a two-hour practice flight before giving permission for a friend to fly the airplane. The friend took off and flew for about 20 minutes, then landed, and taxied back for a second take-off. Witnesses reported that the subsequent climb was very steep and that as the aircraft neared the top of the climb, at about 100 feet above ground level, a loud bang was heard. Pieces were observed to fly off the aircraft, and the aircraft then entered a near-vertical dive and struck the ground. The pilot was fatally injured.

The ultralight's fuselage and tail was constructed using a boxed cable and tube assembly for rigidity. One cable provided an upward tension to the fuselage by running from the leading edge of the horizontal stabilizer to the upper king post at the wing, then back to the stabilizer. When the wreckage was examined, the cable was found to have failed. One portion of the cable was not located. The other portion had failed in tension at the king post attachment point.

Both propeller blades had separated from the propeller hub. One, found 60 feet from the wreckage, showed signs of having struck a cable, hub end first. The other blade was found six feet from the main wreckage and had apparently failed when the aircraft struck the ground. Neither blade showed signs of cable contact along its leading edge.

The propeller hub had been modified to reduce its thickness from two and one-half inches to one and one-half inches. The modification was made to accommodate the ultralight's engine and was not authorized by the manufacturer.

The propeller, which was weakened when the hub was modified, failed under the heavy air loads imposed by the steep climb after take-off. One blade separated, struck the upper supporting cable, causing it to fail. As a result, the fuselage was without upward tension and was pulled downward. This movement increased the horizontal stabilizer's angle of attack and resulted in a pitch down and subsequent uncontrollable dive.

FINDINGS:

Cause Related:

1. The hub of the propeller was weakened when it was modified to accommodate the ultralight's engine.

2. One blade of the propeller separated near the hub due to heavy air loads imposed during a steep climb.

3. The blade struck the upper fuselage supporting cable, causing it to fail, and the aircraft pitched down and entered an uncontrollable dive.

SUMMARY REPORT:

The ultralight's owner had just completed a two-hour practice flight before giving permission for a friend to fly the airplane. The friend took off and flew for about 20 minutes, then landed, and taxied back for a second take-off. Witnesses reported that the subsequent climb was very steep and that as the aircraft neared the top of the climb, at about 100 feet above ground level, a loud bang was heard. Pieces were observed to fly off the aircraft, and the aircraft then entered a near-vertical dive and struck the ground. The pilot was fatally injured.

The ultralight's fuselage and tail was constructed using a boxed cable and tube assembly for rigidity. One cable provided an upward tension to the fuselage by running from the leading edge of the horizontal stabilizer to the upper king post at the wing, then back to the stabilizer. When the wreckage was examined, the cable was found to have failed. One portion of the cable was not located. The other portion had failed in tension at the king post attachment point.

Both propeller blades had separated from the propeller hub. One, found 60 feet from the wreckage, showed signs of having struck a cable, hub end first. The other blade was found six feet from the main wreckage and had apparently failed when the aircraft struck the ground. Neither blade showed signs of cable contact along its leading edge.

The propeller hub had been modified to reduce its thickness from two and one-half inches to one and one-half inches. The modification was made to accommodate the ultralight's engine and was not authorized by the manufacturer.

The propeller, which was weakened when the hub was modified, failed under the heavy air loads imposed by the steep climb after take-off. One blade separated, struck the upper supporting cable, causing it to fail. As a result, the fuselage was without upward tension and was pulled downward. This movement increased the horizontal stabilizer's angle of attack and resulted in a pitch down and subsequent uncontrollable dive.

FINDINGS:

Cause Related:

1. The hub of the propeller was weakened when it was modified to accommodate the ultralight's engine.

2. One blade of the propeller separated near the hub due to heavy air loads imposed during a steep climb.

3. The blade struck the upper fuselage supporting cable, causing it to fail, and the aircraft pitched down and entered an uncontrollable dive.

Other:
- Nil -

✈ ✈ ✈ ✈ ✈

ULTRAFLIGHT LAZAIR MK III (Ultralight) C-IGLK
WHITE ROCK, BRITISH COLUMBIA
28 JULY 1984

REPORT NUMBER: 84-P45008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1915 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	100	20
LAST 90 DAYS	4	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight was cruising at 600 feet above ground level when the right engine (Rotax 185) failed. The pilot could not maintain altitude in other than straight and level flight, and he decided to carry out a precautionary landing onto a park playground. The aircraft touched down long, struck a log barrier at the end of the field, and nosed over.

Examination of the right engine revealed that the crank shaft had failed in fatigue for undetermined reasons. The propeller on this engine was different from that which was provided with the ultralight kit and may have contributed to the crankshaft failure. With one engine still operating, the pilot should have been able to land successfully on the field; however, he misjudged the landing, and the ultralight overran the field.

FINDINGS:

Cause Related:

1. The crankshaft of the right engine failed in fatigue for undetermined reasons.

2. The pilot misjudged the landing, and, as a result, the ultralight landed long and the ultralight overran the field.

son for the failure of the engine to develop full power. All normally aspirated engines require frequent applications of power during periods of prolonged operation at idle power. In this case, the throttle was left at idle for the entire exercise, and, as a result, the engine misfired when full throttle was applied. When the instructor attempted to take control of the ultralight, he was unable to do so in a timely manner because of either confusion or misunderstanding on the part of the student.

By the time he had gained full control, the aircraft was too low to permit a normal landing flare. Crew coordination during the change of control was inadequate.

FINDINGS:

Cause Related:

1. Improper engine handling during the exercise resulted in the engine misfiring when full throttle was applied.

2. Lack of coordination between the student and the instructor during the change of aircraft control allowed the aircraft to descend to the point where there was insufficient height for a landing flare.

Other:

1. The pilot providing the instruction did not possess an instructor rating.

* * * * *

PITTS S-1 (Amateur-built) C-FTEF
COPPERSFIELD STRIP, BRITISH COLUMBIA
13 AUGUST 1984

REPORT NUMBER: 84-P40045 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0850 PDT
OPERATION: Private Ferry
DAMAGE: Substantial
PILOT LICENCE: Commercial

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	3,400	230
LAST 90 DAYS	25	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

About 15 minutes after take-off, while cruising in level flight, the aircraft started to vibrate. The pilot confirmed that the magnetos were not the cause, and he started reducing engine power. At about 2000 rpm, a piece of the propeller broke off. The engine was shut down immediately, and the pilot force-landed on a 2500-foot private airstrip. On touchdown, the landing gear support brace broke, and the landing gear partially collapsed. The aircraft nosed down, the air cleaner dug into the ground, and the aircraft nosed over.

Two-thirds of one propeller blade had broken off in flight. The investigation revealed that the blade failed in overload after it had been weakened by fatigue cracking. There are indications that crack initiation was associated with foreign object damage. The fatigue crack was not detected during the pre-flight inspection.

The pilot did not flare the aircraft prior to touchdown; as a result, the aircraft landed hard and the landing gear was damaged.

The following laboratory report was completed:
LP 274/84 - Propeller Blade Failure Analysis.

FINDINGS:

Cause Related:

1. The propeller failed because of fatigue cracking and a forced landing was carried out.

2. The pilot did not flare the aircraft, which resulted in a hard landing.

Other:

-Nil-

* * * * *

ULTRAFLIGHT SALES LTD. LAZAIR II
(Ultralight) C-ICWW
KAMLOOPS, BRITISH COLUMBIA 12 mi E
21 AUGUST 1984

REPORT NUMBER: 84-P45010 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0900 PDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	140	10
LAST 90 DAYS	25	10

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

The instructor was taking the student on a local familiarization flight over the Thompson River, when the ultralight's right engine apparently began to run rough. The aircraft entered a descending right turn, which the instructor was unable to correct, and the ultralight's right wing struck the water. The aircraft crashed near the shore, and the pilots exited the aircraft and beached it without difficulty.

The six bolts which held the right propeller to its hub had failed, and, consequently, the propeller separated from the aircraft. Laboratory examination of the failed bolts showed that they were suitable for use in the propeller, but that they had failed from bending, following progressive fatigue. Bolts from the left propeller were examined, and they also showed signs of progressive fatigue cracking, which would have resulted in a sequential failure of all six bolts.

The fatigue was caused by a loss of torque on the bolts. The propeller had been installed 1.7 flight hours before this flight and had been torqued to the manufacturer's specifications. The loss of torque occurred in flight as a result of vibration.

The instructor lacked training in the handling techniques to be employed when faced with an asymmetric thrust situation. As a result, he did not reduce power on the left engine in order to regain directional control.

The following laboratory report was completed:
LP 285/84 - Propeller Bolts Examination.

FINDINGS:

Cause Related:

1. The six bolts holding the right propeller to its hub failed because of fatigue as a result of a loss of torque.

2. Because of a lack of training, the instructor did not employ the correct handling technique when faced with an asymmetric thrust situation and was unable to maintain directional control.

Other:
-Nil-

SAFETY ACTION:

Action Taken:
On 26 September 1984, Ultraflight Sales Ltd. issued a memorandum to their dealers and distributors alerting them to possible vibration problems that could arise from use of non-standard propellers. This vibration could, in turn, cause loss of torque in the propeller hub bolts and promote fatigue failure.

* * *

CHINOOK-WT11 (Ultralight) C-ICCM
COALDALE, ALBERTA
30 SEPTEMBER 1984

REPORT NUMBER: 84-W45010 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1315 MDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Ultralight, Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	140	30
LAST 90 DAYS	24	24

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was observed flying at about 100 feet above ground level, at high power, and at near maximum speed for level flight. The aircraft banked steeply to the left; the nose dropped, and the aircraft crashed after turning through 180 degrees.

The aircraft struck the ground in a near-vertical attitude at a relatively high speed and it did not stall before impact. Because the damage to the aircraft was so severe, the accident was deemed to be non-survivable. There was no evidence of pre-crash failure or malfunction.

The weather was scattered clouds at 30,000 feet, visibility over 50 miles, light and variable wind, and temperature at five degrees Celsius. There was no reported turbulence in the area.

An autopsy revealed that the pilot had coronary artery disease. He had a 75 per cent stenosis of the coronary arteries. It could not be determined conclusively if the circumstances of the accident and the degree of heart disease were consistent with pilot incapacitation or the cause of the accident.

FINDINGS:

Cause Related:

1. The aircraft departed from controlled flight for undetermined reasons.

Other:
1. The pilot had coronary artery disease.

* * * * *

TERATORN TIERRA II (Ultralight) C-IFDQ
COCHRANE, ONTARIO 4 mi S
6 NOVEMBER 1984

REPORT NUMBER: 84-O45025 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1430 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	64	47
LAST 90 DAYS	56	39

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot of the ultralight was preparing for take-off from a private strip to practise circuits. He taxied the length of the runway several times to ensure that the engine was running properly. The aircraft took off and at about 75 feet above the runway, the engine lost power. Because of obstacles in the overrun area, the pilot attempted a forced landing on a field which was orientated at right angles to the runway. During the turn for landing, the right wing struck the ground, and the aircraft veered to the right before coming to rest.

An examination of the fuel system revealed that there was water in the fuel line that runs from the fuel tank to the carburettor. This water interrupted the flow of fuel to the engine, causing the engine to lose power after take-off.

FINDINGS:

Cause Related:
1. The engine lost power because of an interruption in the fuel flow to the engine, caused by water in the fuel system.

Other:
-Nil-

* * * * *

MITCHELL U-2 (Ultralight Amateur-built) C-ICQG
PITT MEADOWS AIRPORT, BRITISH COLUMBIA
07 JANUARY 1985

REPORT NUMBER: 85-P55001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1245 PST
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1.2	-
LAST 90 DAYS	-	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Just after take-off, and at 25 to 50 feet above ground level, the ultralight aircraft turned steeply left toward downwind and started to descend. The aircraft rolled level momentarily then continued the left turn. The ultralight turned through about 180 degrees, and the wings were levelled as the aircraft contacted some small bushes. The aircraft then crashed nose down into a ditch; the pilot was not injured.

The weather at the time was good with calm winds, 30 miles visibility, a temperature of five degrees Celsius, and a dew point temperature of minus two degrees.

There were no pre-accident aircraft malfunctions or failures; however, the student pilot stated that the engine lost "a little bit of power" as he started the turn. The presence of carburettor ice could account for a power loss, and, although air and dew point temperature were such that carburettor ice could have formed, there was no visible moisture present. As well, the student pilot had been fast taxiing and making short flights along and close to the runway surface for the previous 20 to 30 minutes with no apparent engine problems.

The student pilot had a total flying time of 1.2 hours, which he flew with his instructor in a Fleet Canuck on 4 July 1984; had taxied and made short "hops" for 15 to 20 hours in his single-seat ultralight, the last recorded trip on 29 October 1984; and was on his first solo flight when the accident occurred. The same instructor monitored, visually and via two-way radio, the 20 to 30 minutes of taxiing and hops and the accident flight, but he had not monitored the 15 to 20 hours of training. The student's log book is annotated with "certified that (name) has reached a satisfactory level of experience and skill to complete solo flight", and it is signed by his instructor. The annotation is not dated and is on a page where the last entry is 29 October 1984.

The student pilot was ill-prepared for this flight. Making short hops at very low level straight down a runway, without any real concern about airspeed or aircraft roll, is vastly different than flying an aircraft around a circuit. His one dual flight, six months prior to the accident, and his unmonitored and unsupervised taxiing cannot be considered adequate preparation for safe solo flight. Once the aircraft became fully airborne and the turn started, the student pilot did not know how to properly coordinate the flight control inputs, and the aircraft crashed.

FINDINGS:

Cause Related:

1. The student pilot was not adequately trained and could not control the aircraft once it was fully airborne.

2. The instructor did not adequately monitor or supervise the student's training and progress, and he prematurely certified that the student had reached a satisfactory level of experience and skill to complete solo flight.

Other:

-Nil-

* * *

TERATORN TIERRA II (Ultralight) C-IFDQ
COCHRANE, ONTARIO 10 mi S
4 APRIL 1985

REPORT NUMBER: 85-O55002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1130 EST
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:

	PILOT IN COMMAND		CO-PILOT	
	ALL TYPES	ON TYPE	ALL TYPES	ON TYPE
TOTAL	92	85	5	5
LAST 90 DAYS	28	28	5	5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The two-seater, ski-equipped ultralight was on a dual-training flight and was approaching to land on a snow-covered field. The instructor had control of the throttle for the approach, and the student was operating the flight controls. The instructor reduced power at the start of the approach descent. The student established a high rate of descent, and the instructor applied full throttle to decrease the rate of descent and increase the airspeed. At the same time, the student pulled back sharply on the control column, causing the ultralight to stall. The instructor took full control of the aircraft and attempted to recover from the stall. The right wing struck the ground, and the aircraft rotated through 180 degrees about the vertical axis and came to a stop.

Throughout the approach, there was a lack of coordination between the instructor throttle inputs and the student control inputs. As a result, the student may have been slow to reduce the aircraft rate of descent. When he finally did so, he applied an excessive amount of back stick and stalled the aircraft. There was insufficient altitude available to recover the aircraft from the stall.

FINDINGS:

Cause Related:

1. The ultralight stalled on final approach due to an incorrect control input.

Other:

1. The approach was flown with the instructor operating the throttle and the student the control column.

* * *

BULKLEY VALLEY SOARING CLUB
BLANIK L-13 (Glider) C-GUQY
SMITHERS AIRPORT, BRITISH COLUMBIA
13 APRIL 1985

REPORT NUMBER: 85-P50010 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1328 PST
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,150	165
LAST 90 DAYS	3	-

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	1

SUMMARY REPORT:

In preparation for a tow-launch from the end of an asphalt runway, the glider was placed behind and to the left of the tow aircraft. To compensate for a strong and variable cross-wind from the right, the nose of the glider was pointed into the wind. During the take-off when the glider was about three to six feet above the ground, the glider pilot attempted to move the glider in behind the tow aircraft; however, the glider remained on the left side of the tow plane. To prevent interfering with the directional control of the tow aircraft, the glider pilot released the tow rope.

The glider's left wing dropped and struck the infield. After the glider pilot released the tow rope, he was unable to maintain control of the aircraft in the strong and variable cross-wind.

FINDINGS:

Cause Related:

1. The glider flight was attempted in a strong cross-wind.

2. The glider pilot was unable to position the glider behind the tow aircraft after take-off.

3. Release of the tow rope, the glider pilot was unable to maintain control in the strong and variable cross-wind.

Other:
-Nil-

* * * * *

THOR AIR TI-2 (Ultralight) C-IFCJ
HARE FIELD, HOLLAND LANDING, ONTARIO
21 APRIL 1985

REPORT NUMBER: 85-O55003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 0950 EST
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	1,000	500
LAST 90 DAYS	15	15

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	2	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot was taking off in his ultralight on a local familiarization flight with a student on board. The surface wind was from the right at five mph and the right side of the runway was partly bordered by a stand of trees about 30 feet high. On climb-out, at approximately 20 to 30 feet in the air, the ultralight began an uncommanded turn to the right. The pilot applied left rudder and left aileron but was unable to stop the turn. The aircraft continued to turn right, struck a tree, and fell to the ground at the bottom of a ravine, seriously injuring the two occupants.

The ultralight had been modified from the original design. The wing tip rudders had been removed and replaced with ailerons built into the outboard trailing edge of the wings. The rear tubular spar had been shortened, and the wing tip compression strut had been modified. Following these modifications, the wing covering material or sail was refitted without being properly fastened at the rear spar. Comprehensive flight testing to verify the flight characteristics of the ultralight with these modifications was not carried out.

These modifications to the ultralight's wings and control surfaces changed the basic design characteristics of the wing in the following ways:

a. As the wash-out angle was not maintained, the wing tip angle of incidence was increased, thus altering the performance characteristics of the aircraft;

b. The modified wing tip compression strut reduced the tension on the sail required to maintain the design aerodynamic characteristics;

c. As the upper surface of the sail was not properly refastened to the rear spar, it was able to flex and thereby alter the airfoil shape; and

d. The installation of ailerons introduced an adverse yaw characteristic during turns. On climb-out, at approximately 20 to 30 feet in the air, the ultralight began an uncommanded turn to the right for undetermined reasons.

FINDINGS:

Cause Related:
1. After take-off, the ultralight experienced an uncommanded roll to the right which the pilot was unable to correct.

2. The modifications to the wing of the ultralight altered the flight characteristics of the aircraft and the effectiveness of the control surfaces.

3. Adequate testing and analysis were not carried out on the ultralight following modification.

Other:
-Nil-

* * * * *

BIRDMAN CHINOOK 2S (Ultralight) C-IFXP
PENETANGUISHENE, ONTARIO
28 APRIL 1985

REPORT NUMBER: 85-O55004 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 0800 EST
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	155	52
LAST 90 DAYS	25	25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight pilot planned to depart for a cross-country trip from a field behind his residence. He did not normally use this field and was concerned about the limited size. On take-off, the aircraft was not airborne at the previously selected no-go point, and the pilot closed the throttle. At this point, a gust of wind caused the aircraft to become airborne. The pilot applied power to regain control and then attempted to land the aircraft. The aircraft touched down at an angle to the take-off path and struck a post during the landing roll.

Although the wind appeared calm at the start of the take-off run, the pilot stated that the ground speed prior to the no-go point was higher than normal, indicating a possible tail wind. When the aircraft became unintentionally airborne, it was beyond the no-go point. While the aircraft was airborne, the pilot was unable to maintain directional control and, as a result, landed at an angle to the take-off path. There was no wind sock or other wind indicator available at the site.

FINDINGS:

Cause Related:
1. During a take-off attempt from a field of limited size, the pilot rejected the take-off as the aircraft was not airborne at the predetermined no-go point.

2. During the rejected take-off, the aircraft became airborne and touched down at an angle to the take-off path and struck a post.

Other:
-Nil-

* * * * *

SKYSEEKER MK II (Ultralight) C-ICBR
CHESTERMERE LAKE, ALBERTA
29 APRIL 1985

REPORT NUMBER: 85-W55001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2010 MDT
OPERATION: Private Recreational
DAMAGE: Destroyed
PILOT LICENCE: Commercial Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	N/A	N/A
LAST 90 DAYS	N/A	N/A

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	2	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The aircraft was observed flying at altitudes up to 500 feet above ground level in the vicinity of Chestermere Lake. It was climbing and diving, and the engine was heard slowing down, or stopping, and accelerating in some sequence with the climbing and diving. After three or four of these sequences, the aircraft entered a vertical dive from several hundred feet. After a few seconds in the dive, the right wing folded back; the left wing may or may not have folded back, and the aircraft struck the ground at about 70 miles per hour. There was no apparent attempt to recover from the dive prior to the break-up of the aircraft. The aircraft was not equipped with a parachute.

The weather was not a factor in the accident as the sky was clear, and there was no wind. The investigation did not reveal any pre-occurrence aircraft failures or malfunctions, however, it did show that the right wing had failed in flight because it had been overstressed.

Some witnesses suggested that the engine kept stopping, and the pilots were attempting to restart it. The area is flat farmland, which would have offered numerous landing sites for an ultralight; however, at no time did it appear that the aircraft was being set up for a landing. It was concluded that engine operation was not pertinent to the accident, as a successful forced landing could have been made at any time prior to the wing failure.

The two pilots involved in this occurrence were heard discussing the upcoming flight. One was going to show the other some spins and spirals, and they were going to practise stalls and steep turns. On previous occasions, one of the pilots had performed manoeuvres where he would enter a steep climb, throttle back to idle, and allow the aircraft to stall in a very nose-high attitude. The nose would then drop to near vertical and, after the speed had built up, the pilot would pull out of the dive. The evidence indicates that the pilots were practising this type of manoeuvre; however, during the final dive, the airspeed was allowed to build up to the extent that the stresses, induced by the high speed, exceeded the structural strength of the aircraft, and the wing failed. Once the wing had folded, recovery was impossible. Had the aircraft been equipped with a parachute, the occupants may have survived the accident.

The following laboratory reports were completed: LP 108/85 - Airspeed Calculations Skyseeker MK II, C-ICBR; and LP 112/85 - Failure Analysis Skyseeker MK II, C-ICBR.

FINDINGS:

Cause Related:
1. The aircraft structure failed because of stresses induced by excessive speed.

Other:
1. The aircraft was not equipped with a parachute.

* * * * *

SCHWEIZER SGS-1-26A (Glider) CF-ZCO
ROCKTON, ONTARIO
4 MAY 1985

REPORT NUMBER: 85-O50029 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1115 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	20	2
LAST 90 DAYS	.7	.5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

As the pilot was setting up for landing, he encountered an area of strong lift that resulted in the glider being high on final approach. The pilot lowered the nose, and he deployed the spoilers momentarily. He overshot the runway and landed 1,900 feet past the upwind end of the runway in a field. The glider struck some bushes and a post and came to rest in an upright position.

The pilot did not adequately compensate for the unexpected lift. As a result, the glider was so high and fast on final approach that it could not be landed on the runway.

FINDINGS:

Cause Related:
1. The pilot did not adequately compensate for the unexpected lift encountered during the approach.

Other:
- Nil -

* * * * *

AIR CADET LEAGUE OF CANADA
SCHWEIZER SGS-2-33A C-GBJR
CHATHAM AIRPORT, ONTARIO
(4218N 8205N)
12 MAY 1985

REPORT NUMBER: 85-O50030 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1015 EDT
OPERATION: Private Training
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	169/20	109/20
LAST 90 DAYS	9/1	9/1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	2
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilots, who were conducting glider recurrent training, had just completed a take-off under tow. At 500 feet above ground level (agl) the pilot in command, in the rear seat, released the tow rope to simulate a tow rope failure. The pilot at the controls reversed course to land downwind on the runway. The tail wind was 15 to 20 knots. The pilot deployed the spoilers, increased the airspeed and sideslipped the aircraft in an attempt to land on the runway. About three-quarters of the way down the runway, when it became apparent that a normal landing was not possible, the pilot-in-command took control and turned left to avoid vehicles and people beyond the end of the runway. The left and skidded sideways to a stop off the end of the runway.

The speed and direction, and the effect it would have on the aircraft, was misjudged by the pilots during the tow rope failure excercise. The result was a high speed, downwind approach with little chance of success.

FINDINGS:

Cause Related:

1. The pilot-in-command released the tow rope at 500 feet agl to simulate a tow rope failure.

2. The pilot at the controls reversed course to land downwind on the runway.

3. The crew did not properly compensate for the tail wind during the approach.

4. As the aircraft was turning left to avoid congestion near the runway, the left wingtip hit a runway light.

Other:
-Nil-

* * * * *

SUN FUN ULTRALIGHT AVIATION INC.
BEAVER RX28 (Ultralight) NOT REGISTERED
(Not Required Prior to 1 July 1985)
DELTA AIR PARK, BRITISH COLUMBIA
15 MAY 1985

REPORT NUMBER: 85-P55002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1040 PDT
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: None (Not Required Prior to 1 July 1985)

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	24	2
LAST 90 DAYS	8	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The pilot had departed the Sun Fun Aviation's aerodrome for a local sightseeing flight and had been airborne for about 30 minutes, when he thought that the ultralight's engine began to run rough. He elected to land at the Delta Airpark, which was the closest suitable aerodrome. During the landing flare, the aircraft encountered a gust of wind and drifted to the right. The pilot was unable to correct the drift, and the ultralight touched down near the runway edge and ran off the right side of the runway.

Because of warmer daytime temperatures, the engine fuel mixture became too lean, a condition which would have caused the engine to run rough.

The wind condition, which caused the aircraft to drift to the right, was within the ultralight's cross-wind capability. However, the pilot allowed the airspeed to decay while he was attempting to correct back to the centre line, and the aircraft apparently stalled. It touched down on the runway at a point very close to the runway edge, and the pilot was unable to prevent the ultralight from running off the side of the strip in the space that remained.

The pilot had received two half-hour dual training flights in the Beaver ultralight prior to this flight. He lacked the proficiency to simultaneously cope with the cross-wind landing and the engine problem.

FINDINGS:

Cause Related:

1. The engine ran rough because warmer daytime temperatures had caused the fuel mixture to become too lean.

2. While the pilot was attempting to direct the aircraft back to the centre line, he allowed the airspeed to decay, and the aircraft apparently stalled.

3. The pilot lacked the proficiency to simultaneously cope with a cross-wind landing and an engine problem.

Other:

-Nil-

* * * * *

DELTA SAILPLANE CORP. DS-27C
(Ultralight) C-IHMI
SIDNEY, BRITISH COLUMBIA
19 MAY 1985

REPORT : 85-P55003 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1950 PDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	5	3
LAST 90 DAYS	2	0.5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

Shortly after taking off in his ultralight, the student pilot noticed an engine vibration (Rotax 503) and decided to land as soon as possible. He completed a low circuit, and when the aircraft was about 15 feet above ground level on final approach, the pilot reduced engine power. The ultralight then pitched down and struck the ground in a nose-down attitude. The aircraft's tubular frame was folded inward; the pilot, who was wearing his shoulder harness, was not seriously injured.

The aircraft had been stored with its wooden propeller in a vertical position, which allowed water to accumulate in the lower propeller blade. This water accumulation caused an imbalance, which, in turn, caused the engine to vibrate.

It was not determined why the pilot chose to reduce engine power at that point in his approach. However, it was noted that he lacked experience on this type of aircraft and that, as there were no two-place variants of the aircraft, he had not received any in-flight dual instruction.

Using a video tape of the occurrence flight made by the instructor, the investigation determined that the aircraft was flown at very low altitude during the circuit and that the pilot was varying the engine power throughout. When the power was reduced on final approach, the aircraft's pitch attitude was not reduced, and, as a result, the ultralight stalled. Because of the low altitude, the pilot was not able to effect a recovery. The pilot's failure to adjust the pitch attitude was attributed to his lack of in-flight training and experience.

Investigators concluded that the pilot's use of a shoulder harness likely prevented serious injury during the nose-down impact.

FINDINGS:

Cause Related:

1. The aircraft was stored with its wooden propeller in a vertical position which allowed water to accumulate in the lower blade and resulted in an in-flight vibration because of an imbalance.

2. The pilot reduced engine power while on final approach but did not adjust the ultralight's pitch attitude; as a result, the aircraft stalled at low altitude, and a recovery could not be effected.

Other:

1. The pilot's use of a shoulder harness prevented serious injury during the impact.

* * * * *

ULTRAFLIGHT LAZAIR II (Ultralight) C-IAOW
KAKABEKA FALLS, ONTARIO 3 mi W
21 MAY 1985

REPORT NUMBER: 85-C55001 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1130 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	408	8
LAST 90 DAYS	2	2

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was on a local pleasure flight in the twin-engine ultralight, and he intended to land on a farm field near a relative's home. He was not satisfied with his first approach to land, and he applied power to overshoot. Moments later, the right engine lost power, and the aircraft struck a power line, then fell to the ground. The pilot was seriously injured.

The right engine's carburettor mounting bolts were loose and a gap of about one-sixteenth of an inch existed between the carburettor and the engine housing. The pilot had been maintaining the aircraft.

The manufacturer states that the ultralight can maintain level flight with only one engine operating. Some months prior to this flight, the pilot received a ground briefing on the ultralight aircraft but did not receive any dual in-flight training. He was not under the supervision of an ultralight instructor. The pilot had about 400 hours of flight experience in gliders and held a glider pilot licence.

The right engine lost power because of an excessively lean fuel/air mixture caused by air leaking into the gap created by the loose mounting bolts. During maintenance, the pilot did not ensure that the carburettor mounting bolts were secured. Although the ultralight was capable of level flight with only one engine operating, the aircraft was unable to climb over the power line.

FINDINGS:

Cause Related:

1. The pilot, who maintained the aircraft, did not ensure that the carburettor mounting bolts were secured prior to the flight.

2. The engine lost power because of an excessively lean fuel/air mixture which was caused by air leaking into the gap between the carburettor and the engine housing.

3. The pilot was unable to avoid a power line following an engine power loss.

Other:

1. The pilot was not under the supervision of an ultralight instructor when the flight was made.

* * * * *

THOR-AIR T1-2 (Ultralight) C-IFWL
LONDON, ONTARIO, 10 mi N
22 MAY 1985

REPORT NUMBER: 85-O55005 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1830 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	29	12
LAST 90 DAYS	4	4

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

After a one-hour flight, the pilot landed his ultralight aircraft on a private airstrip. He refuelled and took off immediately. Shortly after take-off, the engine stopped, and the pilot force-landed the aircraft in a deep drainage ditch.

The investigation established that refuelling this aircraft involves removing the fuel stand-pipe from the fuel tank. When the stand-pipe is removed, some fuel drains from the fuel line. Once the stand pipe is replaced, air becomes trapped in the fuel line and moves through the system, creating an air lock. When the air lock reaches the carburettor, the engine stops. Prior to take-off, the pilot did not run the engine to remove the air from the fuel system. As a result, the engine stopped when the air lock reached the carburettor. When the engine stopped, the aircraft did not have sufficient height to glide beyond the drainage ditch at the end of the airstrip.

FINDINGS:

Cause Related:

1. When the fuel stand-pipe was removed from the tank for refuelling, some fuel drained from the fuel line; as a result, air became trapped in the fuel line when the stand-pipe was replaced.

2. The pilot did not prime the fuel line to remove the air from the fuel system and took off shortly after refuelling.

3. The engine stopped immediately after take-off when an airlock in the fuel line reached the carburettor.

4. The aircraft did not have sufficient height to glide beyond the drainage ditch at the end of the runway.

Other:
- Nil -

* * * * *

SKYTREK SKYSEEKER MK III (Ultralight) C-IBGF
PIGEON LAKE, MANITOBA
27 MAY 1985

REPORT NUMBER: 85-C55002 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1600 CDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	41	37
LAST 90 DAYS	3	3

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot was on a local flight in his ultralight to carry out aerial inspections of his crops. He had completed an inspection of one field and was transiting at low level along the Assiniboine River to another field, when the ultralight struck the water and was substantially damaged. The winds in the area were light and the aircraft's weight and centre of gravity were within the prescribed limits. The pilot was not under the supervision of an ultralight instructor when the flight was made.

The tail unit of the ultralight is removable for car-top transportation. When attached to the aircraft, the tail is held in two places by a stainless steel vinyl-coated cable which is swaged in the centre to a single eyelet. The eyelet is then attached to the overwing kingpost and the cable is tensioned. The cable had failed at the swaging and a laboratory examination revealed that the failure was due to tensile overloading. The laboratory was unable to determine if the failure occurred during or prior to the water impact.

The cause of the accident was undetermined; however, if the cable failed in flight, the tail unit would have been free to move downward. This downward movement would have caused the aircraft to pitch nose down uncontrollably. If the cable failed on impact, then it is likely that the pilot misjudged his height and allowed the aircraft to strike the water. The pilot was flying at such a low altitude that he was unable to state whether the ultralight had pitched down prior to striking the water.

The following laboratory report was completed:
LP 171/85 - Cable Separation - Skyseeker III, C-IBGF.

FINDINGS:

Cause Related:

1. For undetermined reasons, the ultralight aircraft struck the water.

Other:

1. The pilot was not under the supervision of an ultralight instructor when the flight was made.

* * * * *

SCHWEIZER SGS-1-26D (Glider) CF-QVU
ARISS, ONTARIO 3 mi NE
29 MAY 1985

REPORT NUMBER: 85-O50036 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1837 EDT
OPERATION: Private Other
DAMAGE: Substantial
PILOT LICENCE: Private

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	11	.5
LAST 90 DAYS	1	.5

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The glider touched down on the runway at a higher than normal airspeed and bounced twice. The pilot realized he could not stop before hitting a fence off the end of the runway, so he turned the glider to the right. During the turn, the glider struck the ground, cartwheeled, and came to a stop.

The pilot was unable to deploy the spoilers when he initially set up to land; however, he circled for a while so that he could land without having to use them. He commenced the final approach at too high an altitude; he side-slipped and increased the speed to get down and, subsequently, crossed the threshold at a speed that did not permit him to stop on the runway.

The investigation revealed that the spoilers were operable; however, for undetermined reasons, the pilot was unable to deploy them. Therefore, the pilot did not have the use of the spoilers to assist in speed and altitude control.

FINDINGS:

Cause Related:
1. The pilot experienced difficulty controlling speed and altitude on final approach, a situation made more difficult because, for undetermined reasons, he did not have the use of the spoilers.

Other:
-Nil-

✈ ✈ ✈ ✈ ✈

SUN FUN II AVIATION INC.
EIPPER QUICKSILVER MXII (Ultralight) C-IBXZ
YARROW, BRITISH COLUMBIA
02 JUNE 1985

REPORT NUMBER: 85-P55004 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1000 PDT
OPERATION: Flying Club Training
DAMAGE: Substantial
PILOT LICENCE: Student

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	60	15
LAST 90 DAYS	.25	.25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The student pilot had taken the two-seater ultralight airplane for a local practice flight in order to use up his last hour of prepaid flying time. He made three touch-and-go landings without difficulty. Shortly after becoming airborne on the fourth take-off, the pilot was unable to correct a left bank, and the left wing struck a tree stump. The aircraft swung to the left and came to rest in bushes bordering the runway.

The student pilot had not flown for an estimated eight months preceding the accident. As well, he was unfamiliar with this type of ultralight which used foot-pedal-activated spoilerons for roll control. He depressed both foot pedals simultaneously, while attempting to correct the bank. As a result, both spoilerons were activated, causing a lift reduction and preventing a bank correction.

The flight had not been authorized and the student pilot was not under the supervision and direction of an instructor. The student pilot felt that he could carry out the flight, as he had prepaid the flying time and had flown previously under what he considered to be similar circumstances.

FINDINGS:

Cause Related:
1. The student pilot had not flown for an estimated eight months preceding the accident.

2. The student pilot was unfamiliar with this type of ultralight and was unable to correct a left bank, resulting in the aircraft striking a tree stump after take-off.

Other:

1. The flight was made without authorization, and the student pilot was not under the supervision and direction of an instructor.

* * * * *

BIRDMAN ENTERPRISES CHINOOK WT II (Ultralight) C-ICDJ
ROSEVILLE, ONTARIO
26 JUNE 1985

REPORT NUMBER: 85-O55009 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2017 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Student Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	15	5
LAST 90 DAYS	1	1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	1	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight aircraft took off to the west from a private aerodrome. After reaching the height of the surrounding trees, the aircraft stopped climbing. The pilot started a left turn toward the airstrip, but, in the turn, the aircraft nosed down and struck the ground in a 60-degree nose-down attitude.

The investigation did not find any evidence of an engine or airframe deficiency prior to impact. Although the wind was calm at ground level, it is probable that an easterly wind was blowing above tree-top level. The pilot reported throttling the power back to the three-quarter-position after take-off; he also pulled back on the stick when the climb performance deteriorated.

The tail wind encountered above the trees caused a reduction in climb performance. Although the pilot realized that the climb could not be maintained, he continued to pull back on the stick and simultaneously entered a turn. However, full power was not applied in this manoeuvre, and the airspeed was allowed to decay. As a result, the aircraft stalled and struck the ground.

FINDINGS:

Cause Related:

1. While climbing above the tree-top level, the aircraft encountered a tail wind which caused a deterioration in the climb performance.

2. The pilot did not release the back pressure on the stick and did not apply full power to maintain a suitable airspeed in the turn; as a result, the aircraft stalled in the turn and struck the ground.

Other:

- Nil -

* * * * *

EIPPER QUICKSILVER MX (Ultralight) C-IARJ
ELMIRA, ONTARIO
26 JUNE 1985

REPORT NUMBER: 85-O55008 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 1941 EDT
OPERATION: Private Testing
DAMAGE: Substantial
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	137.0	107.0
LAST 90 DAYS	0.1	0.1

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

The ultralight aircraft took off on a westerly heading from a paved parking lot and started the climb-out. Ahead and to the left of the climb path was a built-up area, to the right was a power line. At a height of about 40 feet, the aircraft stopped climbing. The pilot reduced the power and landed on the edge of a field. The aircraft overran the field and continued into a parking lot, where it struck a parked truck.

The investigation did not find any evidence of any engine or airframe deficiency prior to impact. The pilot had waited until there was little or no wind before taking off toward the west. The wind had been blowing all day from the east. According to the evidence, when the aircraft reached a level of 40 feet, it encountered an easterly tail wind which was not blowing on the ground. This wind shear caused a severe deterioration in the climb performance. When the aircraft stopped climbing, the pilot realized that the aircraft was at too low an altitude to clear the power line or built-up area, and he decided to land on the field. The aircraft could not be stopped in the field and ended its landing run in the parking lot, where it struck the truck.

FINDINGS:

Cause Related:

1. Because of the wind shear at low level, the aircraft stopped climbing at about 40 feet above ground level.

2. Faced with obstacles ahead and to each side, the pilot attempted a forced landing on the field.

3. The aircraft overran the field and ended its landing run in a parking lot, where it struck a parked truck.

Other:
- Nil -

* * * * *

STANDARD LIBELLE 201B (Glider) C-GNBE
GUELPH, ONTARIO, 4 mi S
29 JUNE 1985

REPORT NUMBER: 85-O50053 (Accident)
INFORMATION SOURCE: Correspondence Investigation
LOCAL TIME: 1730 EDT
OPERATION: Private Recreational
DAMAGE: Substantial
PILOT LICENCE: Glider

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	168	17
LAST 90 DAYS	10	7

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	-	-	1
PASSENGERS	-	-	-

SUMMARY REPORT:

En route, on an out-and-return flight from Rockton, Ontario, the pilot encountered subsiding air and was forced to land. He selected what appeared to be a suitable landing area, a slightly upsloping grain field, and landed the glider into wind. The right wing contacted the grain, and the aircraft rotated 90 degrees to the right and stopped. The glider sustained substantial damage to the fuselage.

The pilot was forced to land because of subsiding air and was unable to reach a suitable landing area.

FINDINGS:

Cause Related:

1. The pilot was forced to land because of subsiding air and was unable to reach a suitable landing area.

Other:
- Nil -

* * * * *

SKY PUP (Ultralight) C-IGAR
VINELAND, ONTARIO 4 mi S
30 JUNE 1985

REPORT NUMBER: 85-O55010 (Accident)
INFORMATION SOURCE: Field Investigation
LOCAL TIME: 2029 EDT
OPERATION: Private Testing
DAMAGE: Destroyed
PILOT LICENCE: Private Ultralight

PILOT HOURS:	ALL TYPES	ON TYPE
TOTAL	9	.25
LAST 90 DAYS	2	.25

INJURIES:	FATAL	SERIOUS	MINOR/NONE
CREW	1	-	-
PASSENGERS	-	-	-

SUMMARY REPORT:

The single-seat ultralight aircraft piloted by its owner and builder took off for its initial flight. After take-off, the pilot completed a left-hand circuit and a low pass to allow his wife and daughter to take photographs. The aircraft then began a left climbing turn and pulled up more steeply as the engine speed increased. As the aircraft was approaching a power line, it suddenly banked to the right, and the right wing struck the top wire. The aircraft pitched nose down and came to rest in a ditch that ran parallel to the power line. The pilot was fatally injured.

This type of ultralight has no ailerons or spoilers, and roll control is achieved by the use of the rudder. Inputs to this control surface introduce a skidding movement which, in turn, banks the aircraft because of the wing dihedral. The aircraft, powered by a 28HP engine (Rotax 277), rotates counter-clockwise, and the torque of this engine tends to roll the aircraft to the right.

A combination of the pull-up, the skid in the left turn, and the increase of the rudder input, due to the increase in engine torque, caused the right wing to stall near the power line. As a result, the aircraft rolled rapidly to the right, and the right wing struck the top wire of the power line.

Following the low pass, the aircraft maintained an altitude which was much closer to the power line than that following the take-off. The pilot attempted a sharp left climbing turn with full-power application as the aircraft approached the power line but induced a stall in the process. As this was his first flight in the aircraft type, he was unfamiliar with its handling characteristics.

FINDINGS:

Cause Related:

1. Following a low pass, the pilot attempted a sharp left turn while applying full power.

2. A combination of the pull-up, the skid in the left turn and the engine torque caused the right wing to stall and strike the top wire of the power line.

3. The pilot was performing his first flight in this type of aircraft.

Other:

-Nil-

✈ ✈ ✈ ✈ ✈

Aviation Safety Recommendations

Occurrence	Subject	Recommendation
Various incidents (Aviation Safety Advisory)	ATC Procedures – Simultaneous Line-Up	The Department of Transport reconsider the air traffic control procedures used during simultaneous line-up of aircraft for sequential take-offs to ensure that adequate safeguards are incorporated. CASB 87-16
Report on a Special Investigation into the RISK OF COLLISIONS INVOLVING AIRCRAFT ON OR NEAR THE GROUND at Canadian Civil Airports	Visibility – Line-of-sight	The Department of Transport increase its priority on current efforts to reduce the restrictions to line-of-sight visibility from control towers and flight service stations. CASB 87-17
	Visibility – Scanning Techniques	The Department of Transport augment its program aimed at fostering the practice of the most effective scanning techniques by all personnel involved in operations on manoeuvring areas. CASB 87-18
	Visibility – Conspicuity	The Department of Transport, following whatever additional research is necessary, implement additional measures for increasing the conspicuity of aircraft and vehicles operating on or near airport surfaces by amending current operating practices and, where necessary, the equipment requirements for aircraft and vehicles. CASB 87-19
	Visibility – Sea-of-Blue Effect	The Department of Transport implement a comprehensive program to reduce the "sea-of-blue" effect at Canada's largest and busiest airports. CASB 87-20
	Visibility – Aerodrome Surface Detection Equipment (ASDE)	The Department of Transport investigate the addition of a positive identification capability to the ASDE equipment currently being installed at major Canadian airports. CASB 87-21
	Information Transfer – ATC Procedures	The Department of Transport review the appropriateness of the timing and wording of all relevant ATC procedures for vehicles or aircraft operating on or near the ground, with a view to maximizing the probability of effective information transfer, thereby reducing the risk of collision. CASB 87-22
	Information Transfer – Intra-Tower Coordination	The Department of Transport review the adequacy of current procedures for effecting intra-tower coordination between the ground and airport controllers. CASB 87-23
	Information Transfer – Phraseology	The Department of Transport: a) continue to refine relevant ATC phraseology with a view to eliminating any ambiguity or potential for confusion; and b) undertake a national campaign to promote the use of standard phraseology by all pilots, ATS personnel, and vehicle operators. CASB 87-24
	Information Transfer – Mandatory Readback	The Department of Transport: a) require pilots and vehicle operators to provide a verbatim readback of all instructions to enter, exit, cross or hold short of an active runway; and b) ensure that all ATS personnel understand the need to listen intently to clearance readbacks in order to detect errors. CASB 87-25

Occurrence	Subject	Recommendation
	Information Transfer – Noise	The Department of Transport: a) encourage the wearing of noise-reducing headsets by pilots, vehicle operators, and ATS personnel during those phases of operations where noise may impede effective transfer of critical information concerning ground movements; and b) promote the use of intercom systems for intra-cockpit communciations in light aircraft. CASB 87-26
	Information Transfer – Call-Signs	The Department of Transport: a) promote, among all constituents of the aviation community, the use of full call-signs wherever there is any possibility of ambiguity; and b) ensure that all Transport Canada assigned or approved call-signs are discrete and unambiguous, particularly for vehicles operating on manoeuvring areas. CASB 87-27
	Information Transfer – Frequency Congestion	The Department of Transport take whatever actions are necessary to reduce congestion on the ground frequency, particularly at Canada's busiest airports. CASB 87-28
	Pilot Training	The Department of Transport: a) initiate a national safety campaign promoting the practice of basic airmanship by all pilots during ground operations; and b) review the course content of basic pilot training, pilot decision-making training, etc. with a view to incorporating increased emphasis on safe ground operating procedures. CASB 87-29
	Vehicle Operations – Airport Traffic Directives	The Department of Transport: a) implement strengthened national standards for airport traffic directives as quickly as possible; b) ensure that airport managers have the requisite authority to enforce national airport directives; and c) require that all airports certified by, but not owned and operated by, Transport Canada effectively meet the strengthened national standards for airport traffic directives. CASB 87-30
	Vehicle Operations – Airport Vehicle Operator Permit (AVOP) System	The Department of Transport: a) accelerate implementation of its strengthened AVOP system at Transport Canada owned and operated aerodromes; and b) require that an equivalent process for AVOP training and certification be implemented at non-Transport Canada owned and operated airports. CASB 87-31
	Vehicle Operations – Decision Training for Ground Operations	The Department of Transport investigate the feasibility of adapting the Pilot Decision-Making Training Program for application in the Airport Vehicle Operator Permit System. CASB 87-32
	Site-Specific Procedures – Low Visibility Procedures	The Department of Transport implement site-specific procedures to take effect at specified reduced visibility conditions, particularly for Canada's busiest airports. CASB 87-33

Occurrence	Subject	Recommendation
	Site-Specific Procedures – High Traffic Volume Operations	The Department of Transport: a) develop site-specific procedures, based on national standards, to further segregate vehicles and aircraft and to expedite the coherent flow of traffic at airports with high traffic volumes; b) develop site-specific procedures, based upon national criteria, for those busy Canadian airports requiring simultaneous, multiple-runway operations; and c) promulgate the criteria and procedures of paragraphs a) and b) above in flight information publications for the benefit of pilots. CASB 87-34
	Site-Specific Procedures – Helicopter Operations	The Department of Transport develop and publish the following site-specific procedures to govern the ground operation of helicopters at major Canadian airports: a) standard VFR arrival and departure procedures; b) standard hover taxi and/or air taxi routes; and c) designated heliports and apron pads. CASB 87-35
	Levels of Service – Signage and Markings	The Department of Transport: a) accelerate its current efforts to upgrade and standardize signage and markings at Canadian aerodromes; and b) participate through ICAO in the development of improved standards where current conventions are inadequate. CASB 87-36
	Levels of Service – Flight Service Stations	The Department of Transport rationalize the levels of service to be expected from FSSs at uncontrolled airports by: a) validating the establishment and discontinuance criteria for control towers and FSSs; b) confirming the adequacy of current staffing levels for FSSs vis-à-vis the evolution of the flight service specialist's responsibilities; c) formally granting flight service specialists the authority to exercise positive control over all vehicles operating on the manoeuvring areas and the authority to designate the preferred runway in use; and d) listing the levels and language(s) of services offered by FSSs in the Canada Flight Supplement. CASB 87-37
	Management – Monitoring	The Department of Transport institute a coordinated program to monitor the effectiveness of local facilities upgrading and maintenance programs, and of local personnel training programs in minimizing the risk of ground collisions. CASB 87-38
	Management – Promotion	The Department of Transport initiate a major safety promotional campaign to reduce the frequency of potential ground conflict situations; this campaign should focus on, but not necessarily be limited to: a) increasing individuals' understanding of those factors which affect their own personal limitations in performance, vigilance, judgement, vision, etc.; b) reducing the common pitfalls in the information transfer process; and c) vividly illustrating the consequence of errors by pilots, ATS personnel, or vehicle operators which cause ground collision situations. CASB 87-39
	Further Study – Volume of Vehicular Traffic	The Department of Transport: a) undertake a critical review of the volume and legitimacy of vehicular traffic crossing airport runways, particularly at Canada's busiest airports; and b) assess the adequacy of existing airport service and access roads in support of essential airside vehicular traffic. CASB 87-40

Occurrence	Subject	Recommendation
	Further Study – Vigilance	The Department of Transport initiate a multi-disciplinary study into the most effective means for sustaining vigilance, particularly for air traffic controllers under periods of low activity rates. CASB 87-41
	Further Study – Human Performance Variables	The Department of Transport undertake a multi-disciplinary review of all the human performance variables, including those related to the information transfer process, which may compromise the effectiveness of ATS personnel, of vehicle operators, and of pilots during the ground phases of operations. CASB 87-42
	Further Study – Alternatives to Radio Telephony	The Department of Transport undertake a feasibility study to explore all available alternatives, including the possible use of digital data link, for reducing the current dependency upon radio-telephony procedures for safe ground operations. CASB 87-43
	Further Study – Integrated Surface Traffic Management System	The Department of Transport undertake the necessary research for the development of an integrated surface traffic management system for implementation at Canada's busiest airports. CASB 87-44
Boeing 737-200 Wabush, Nfld. 20 July 1986	Take-off Performance Requirements – Wet Runway Operations	The Department of Transport revise air carrier procedures involving wet runway take-off operations, in order to provide a margin of safety comparable to that for dry runway operations. CASB 87-45
	Flight Crew Knowledge of Wet Runway Take-off Performance.	The Department of Transport require air carriers to improve flight crew knowledge of the effects of wet runways on take-off performance and the means available to flight crews to provide a margin of safety comparable to that for dry runways. CASB 87-46
de Havilland DHC-8-101 Sault Ste. Marie, Ont. 02 February 1986	Unsafe Flight Training Practice – DHC-8 Simultaneous Engine and Flap Failure	The Department of Transport ensure that its DHC-8 qualified air carrier inspectors and both domestic and foreign DHC-8 operators are formally apprised of the reasons why simultaneous engine and flap failure should not be practised during flight training. CASB 87-47
Lockheed L1011-250/ Boeing 747-200 52° 45' North, 33° 12' West 08 July 1987	Navigation Cross-checks for Long-range Flight.	The Department of Transport ensure that all Canadian operators engaged in long-range flights dependent upon on-board area navigation systems carry out a prescribed series of pre-taxi and en route procedural cross-checks to provide redundant protection against gross navigational errors. CASB 87-48
	International Agreement for Cross-check Procedures of Area Navigation Equipment.	The Department of Transport seek international agreement concerning adequate cross-check procedures of area navigation equipment to reduce the possibility of gross navigational errors during long-range intercontinental flights, particularly over the North Atlantic. CASB 87-49

Occurrence	Subject	Recommendation
McDonnell Douglas DC-8-63 St. Anthony, Nfld. 25 October 1985	Cockpit/Cabin Crew Coordination When Turbulence Expected	The Department of Transport: a) require designation of an in-charge flight attendant for transport category aircraft that carry passengers; and b) specify the minimum qualifications, training standards, and responsibilities for such in-charge flight attendants. CASB 87-50
	Passenger Service Carts – Rapid Securing	The Department of Transport require that all types of passenger service carts and their contents be capable of being rapidly secured in the event of turbulence. CASB 87-51
	Passenger Seat-Belts – Expected Turbulence	The Department of Transport require that in-flight procedures for air carriers emphasize the need to brief passengers fully regarding the fastening of seat-belts whenever turbulence is expected. Furthermore, such briefings should state that cabin crew are to secure the cabin and be seated with their seat-belts fastened. CASB 87-52
	Passenger Seat-Belts – Periodic Inspection	The Department of Transport establish procedures for the periodic inspection of passenger seat-belts on transport category aircraft to ensure their continuing serviceability. CASB 87-53
	Significant Weather Reports – Timely Relay	The Department of Transport ensure the timely relay of pilot reports of significant weather from air traffic services to the Atmospheric Environment Service. CASB 87-54
Bell 214ST Argentia, Nfld. 13 March 1985	SAR Vessels – VHF Direction Finding Equipment	The Department of Transport require that all CCG primary SAR vessels capable of offshore operations and supply boats to the MODUs be equipped with a VHF direction finding system. CASB 87-55
	MODUs – VHF Direction Finding Equipment	The Department of Energy, Mines and Resources require that all MODUs operating in Canadian waters be equipped with a VHF direction finding system. CASB 87-56
	Operations – Underwater Location Beacons	The Department of Transport require operators of all aircraft regularly engaged in offshore operations to equip their aircraft with underwater acoustic locator beacons. CASB 87-57
Study of the Influence of Shoulder Harnesses in Aviation Safety	Shoulder Harnesses – Commercially Operated Aircraft	The Department of Transport require the installation of shoulder harnesses, where practicable, in the flight crew seats of all small commercial aircraft, regardless of their date of manufacture. CASB 87-58
	Shoulder Harnesses – Privately Owned Aircraft	The Department of Transport institute a comprehensive program to promote the benefits of using shoulder harnesses and encourage the installation of shoulder harnesses in privately owned small aircraft. CASB 87-59

Annex 1

List of Reports by Aircraft Manufacturer and Type

REPORT BY AIRCRAFT MANUFACTURER AND TYPE

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
AERONCA	11AC	W50003	76
	7AC	O50045	64
AEROSPATLE	SA316	W54049	93
AYRES	THRUSH	C50046	33
BABY ACE		P40027	101
BEAVER RX28		P55002	111
BEECH	35	C40032	38
		C50023	51
	55	C50030	27
	90	C50015	26
	95	P54006	17
BELL	204B	P50023	97
	206	C40070	89
		P40016	85
		P40033	86
		P40037	86
		P40064	92
		P44012	91
		Q40064	89
		Q40081	91
		W50025	96
	214	P50016	96
	47	P50011	94
		W40051	87
BELLANCA	7ECA	C30118	36
		C40913	43
	8KCAB	O50048	65
BIRDMAN	ATLAS	W45007	102
	CHINOOK	O55004	109
		O55009	116
		W45010	105
BOEING	737200	C44029	1
		C54001	2
		P44010	13
		P54003	3
	737300	P54015	4
	747100	P54001	2
BRITTNORMAN	BN2A	W50021	56
CESSNA	140	C50032	60
		Q40088	44
	150	C40062	40
		O50011	47
		O50025	16
		O50049	65
		O50051	19
		P54016	62
		Q40047	40
	152	C50016	17
	170	C50020	50
	172	O44910	41
		O50040	29
		O50044	31

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
CESSNA (cont'd)		P50017	32
		P50021	20
		P50905	66
		Q30038	20
		Q40004	37
		Q40035	71
		Q40038	73
		Q40056	14
		Q40059	14
		Q40068	23
		Q40078	42
		Q40090	75
		W40052	22
	175	P50005	47
	177	C50035	63
		P50008	48
	180	C40034	72
		C44012	69
		C50007	77
		C54003	26
		P50009	48
		P50022	81
		P50024	81
		P50904	78
		Q40077	74
	185	C44023	39
		C50031	59
		C50044	59
		P40040	73
		P50018	80
		P50020	80
		P50902	53
		P54008	9
		Q40030	70
		Q40061	74
		W40030	70
		W40078	6
		W50008	9
		W50020	55
	188	C50037	30
		C50040	31
		C50050	68
	206	A40004	69
		C44024	22
		C50017	10
		C50049	34
		C50051	34
		O50901	24
	207	W50028	11
	210	O50037	58
		Q50008	25
	310	Q40091	45
	414	C50902	68
CHAMPION	7ECA	Q30018	35

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
CHAMPION (cont'd)	7ECT	C50022	50
	7GC	C50002	76
	7GCB	P40023	72
CZECH	L13	P50010	108
DEHAVND CAN	DHC2	C50039	12
		Q40025	5
		Q40060	5
		Q40065	82
	DHC2T	C50038	18
	DHC3	C50043	12
DELTA	NOMAD	P55003	112
DOUGLAS	DC3	A54006	83
EIPPER	QKSILV	O45002	98
		O55008	116
		P45006	101
		P45007	103
		P45901	99
		P55004	115
ERCO	415	O50026	49
		O50050	66
GLASFLUGEL	BS1	O50053	117
GRUMMAN	G164	W50018	28
	G21	C50028	28
GRUMMANAMER	AA5	Q44040	13
HUGHES	269A	Q30083	84
	500	C50024	94
		Q50014	95
LAKE	LA4	Q40085	75
LOCKHEED	1329	C54011	84
MAULE	M4	C50029	57
	M5220C	W50902	51
MITCHELL	U2	P55001	106
NA ROCKWELL	690	O54902	24
	NA16	O50041	60
NOORDUYN	UC64	C50045	32
PIPER	J3	C50041	79
		C50042	79
	J5	Q40037	39
	PA18	O50052	67
		W50016	78
		W50017	52
	PA20	P30905	35
	PA23AZ	O54041	15
		P54010	10
		Q40017	21
	PA28	C44015	38
		C50025	52
		C50036	54
		C54901	63
		O50003	46
		O50019	16
		O50043	30
		P50013	53
		P50014	54

MANUFACTURER	TYPE	REPORT NUMBER	PAGE
PIPER (cont'd)		Q40062	41
		W40075	45
	PA31	H50001	7
	PA32	O50035	56
	PA38	W50024	19
PITTS	S1	P40045	104
ROTEC	RALLY2	P45004	100
SCHWEIZER	126	O50029	110
		O50036	115
	SGS233	O50030	111
SIKORSKY	S55	W40057	88
SKYTREK	SKYSEEKER	A45001	100
		C55002	114
		P45003	98
		W55001	109
SPORTFLIGHT	SKYPUP	O55010	117
SUDAVIATION	GY80	C44026	42
TAYLORCRAFT	B/B12	C50052	82
		O50038	57
		W50026	61
TERRATORN	TIERRA	O45025	106
		O55002	107
THOR	1A	O55003	108
	TI-2	O55005	113
ULTRAFLIGHT	LAZAIR	C55001	113
		P45008	103
		P45010	104

Annex 2

List of Reports by Province/Territory of Occurrence

REPORTS BY PROVINCE/TERRITORY OF OCCURRENCES

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE
Alberta	84-07-24	W45007	102
	84-08-01	W40051	87
	84-08-03	W40052	22
	84-09-30	W45010	105
	85-01-05	W50003	76
	85-04-29	W55001	109
	85-05-21	W50018	28
	85-05-23	W50020	55
	85-06-01	W50024	19
	85-06-05	P50016	96
	85-06-05	W50025	96
	85-06-06	W50026	61
	85-06-12	W50028	11
British Columbia	83-08-07	P30905	35
	84-03-12	P45003	98
	84-04-02	P45901	99
	84-05-12	P40016	85
	84-06-12	P45004	100
	84-06-15	P40023	72
	84-06-24	P44010	13
	84-07-07	P40027	101
	84-07-14	P45006	101
	84-07-19	P40033	86
	84-07-26	P40037	86
	84-07-28	P45008	103
	84-07-29	P40040	73
	84-07-29	P45007	103
	84-08-13	P40045	104
	84-08-21	P45010	104
	84-09-18	P44012	91
	84-12-27	P40064	92
	85-01-07	P55001	106
	85-02-01	P54001	2
	85-02-16	P50005	47
	85-03-10	P54003	3
	85-03-28	P54008	9
	85-04-05	P50008	48
	85-04-09	P50009	48
	85-04-13	P50010	108
	85-04-24	P54006	17
	85-05-06	P50011	94
	85-05-13	P54010	10
	85-05-13	W50017	52
	85-05-15	P55002	111
	85-05-16	P50902	53
	85-05-17	P50013	53
	85-05-19	P50014	54
	85-05-19	P55003	112
	85-06-02	P55004	115
	85-06-06	P54016	62
	85-06-08	P50904	78
	85-06-16	P50017	32

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE
British Columbia (cont'd)	85-06-23	P50018	80
	85-06-30	P50020	80
	85-06-30	P50905	66
	85-07-03	P50021	20
	85-07-03	P50022	81
	85-07-03	P50024	81
	85-07-04	P50023	97
Manitoba	84-06-30	C44024	22
	84-08-20	C40070	89
	84-09-27	C44026	42
	85-01-05	C50002	76
	85-04-22	C50017	10
	85-04-22	C54003	26
	85-05-07	C50022	50
	85-05-13	C50025	52
	85-05-27	C55002	114
	85-05-30	C54011	84
	85-06-03	C50031	59
	85-06-08	C54901	63
	85-06-19	C50041	79
	85-07-01	C50049	34
	85-07-03	C50051	34
New Brunswick	84-05-19	A45001	100
Newfoundland & Labrador	84-04-13	A40004	69
	85-01-23	A54006	83
Northwest Territories	84-05-07	W40030	70
	84-08-06	W40057	88
	84-09-02	Q40064	89
	85-02-28	W50008	9
Ontario	84-03-25	O45002	98
	84-04-09	C44012	69
	84-06-11	C40034	72
	84-06-24	C44023	39
	84-08-26	O44910	41
	84-10-26	C40913	43
	84-11-06	O45025	106
	84-11-07	C44029	1
	85-01-28	C54001	2
	85-01-31	C50007	77
	85-02-03	O50003	46
	85-02-12	O54902	24
	85-02-15	H50001	7
	85-03-03	O50011	47
	85-03-07	O50901	24
	85-03-18	O54041	15
	85-03-19	O50019	16
	85-04-04	O55002	107
	85-04-09	O50025	16
	85-04-14	O50026	49
	85-04-17	C50016	17
	85-04-21	O55003	108
	85-04-28	O55004	109
	85-05-04	O50029	110
	85-05-08	C50024	94

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE
Ontario (cont'd)	85-05-12	O50030	111
	85-05-15	C50030	27
	85-05-17	C50028	28
	85-05-21	C55001	113
	85-05-22	O55005	113
	85-05-25	O50035	56
	85-05-29	O50036	115
	85-05-30	O50037	58
	85-05-30	O50038	57
	85-06-04	O50040	29
	85-06-04	O50041	60
	85-06-05	P54015	4
	85-06-08	O50043	30
	85-06-15	C50039	12
	85-06-15	O50044	31
	85-06-15	O50045	64
	85-06-19	C50042	79
	85-06-20	C50043	12
	85-06-25	C50045	32
	85-06-25	O50048	65
	85-06-25	O50049	65
	85-06-26	O55008	116
	85-06-26	O55009	116
	85-06-27	O50050	66
	85-06-28	O50051	19
	85-06-29	O50053	117
	85-06-30	O55010	117
	85-07-01	C50902	68
	85-07-01	O50052	67
	85-07-06	C50052	82
Quebec	83-04-13	Q30018	35
	83-06-23	Q30038	20
	83-12-20	Q30083	84
	84-01-28	Q40004	37
	84-04-01	Q44040	13
	84-04-26	Q40017	21
	84-05-28	Q40025	5
	84-06-08	Q40030	70
	84-06-11	Q40035	71
	84-06-22	Q40037	39
	84-06-24	Q40038	73
	84-07-20	Q40047	40
	84-08-10	Q40056	14
	84-08-19	Q40059	14
	84-08-20	Q40061	74
	84-08-21	Q40060	5
	84-08-26	Q40062	41
	84-08-30	Q40065	82
	84-09-04	Q40068	23
	84-09-24	Q40077	74
	84-09-30	Q40078	42
	84-10-08	Q40081	91
	84-10-13	Q40085	75
	84-10-27	Q40088	44

PROVINCE/TERRITORY	DATE	REPORT NUMBER	PAGE
Quebec (cont'd)	84-10-30	Q40090	75
	84-11-03	Q40091	45
	85-03-23	Q50008	25
	85-05-25	Q50014	95
Saskatchewan	83-12-09	C30118	36
	84-05-01	C44015	38
	84-06-11	C40032	38
	84-08-05	C40062	40
	85-04-14	C50015	26
	85-05-07	C50020	50
	85-05-08	C50023	51
	85-05-12	C50038	18
	85-05-19	C50036	54
	85-05-25	C50029	57
	85-06-01	C50044	59
	85-06-03	C50032	60
	85-06-07	C50035	63
	85-06-07	C50037	30
	85-06-15	C50040	31
	85-06-28	C50046	33
	85-07-02	C50050	68
Yukon	84-11-19	W40075	45
	84-11-24	W40078	6
	85-05-04	W50016	78
	85-05-04	W54049	93
	85-05-10	W50902	51
	85-05-23	W50021	56